ALASKA RETIREMENT MANAGEMENT BOARD

BOARD OF TRUSTEES MEETING

TELECONFERENCE: 1-907-202-7104
DECEMBER 3RD ACCESS CODE: 783 110 712#
DECEMBER 4TH ACCESS CODE: 178 325 985#

DECEMBER
3-4, 2020

THURSDAY, DECEMBER 3, 2020

I.	**9:00 am**	**Call to Order**
II.		**Roll Call**
III.		**Public Meeting Notice**
IV.		**Approval of Agenda**
V.		**Public/Member Participation, Communications, and Appearances** (Three Minute Limit)
VI.		**Approval of Minutes – September 17-18, 2020**
VII.		**Election of Officers**
VIII.	**9:10**	**Staff Reports**

1. Retirement & Benefits Division Report
   Ajay Desai, Director, Division of Retirement & Benefits
   Kevin Worley, CFO, Division of Retirement & Benefits
2. Disclosures/Communications/Calendar
   Alysia Jones, ARMB Liaison Officer
3. CIO Report
   Zachary Hanna, Chief Investment Officer
4. Fund Financial Presentation
   Kayla Wisner, State Comptroller
   Kevin Worley, CFO, Division of Retirement & Benefits

IX. 9:40 Trustee & Legal Reports

1. Chair Report, *Rob Johnson*
2. Committee Reports
   A. Audit Committee, *Rob Johnson, Chair*
   B. Actuarial Committee, *TBD*
   C. DC Plan Committee, *Bob Williams, Chair*
   D. Operations Committee, *Rob Johnson, Chair*
   E. Alaska Retiree Health Plan Advisory Board,
   Lorne Bretz, ARMB Member
3. Legal Report, *Stuart Goering, ARMB Legal Counsel*

10:20AM – 10 MINUTE BREAK

X. **10:30** **Presentations**

10:30-11:00 1. Actuarial Presentation
David Kershner, Buck
Scott Young, Buck

11:00-11:45 2. KPMG - Audit Report
Beth Stuart & Melissa Beedle, KPMG

LUNCH – 11:45AM - 1:00PM

1:00-1:40 3. Risk and Return in the Current Market Environment
Zachary Hanna, Chief Investment Officer

1:40-2:20 4. Private Equity Annual Plan
Action: Private Equity Annual Plan Resolution 2020-18
Sean Howard, State Investment Officer

2:20-3:00 5. Private Equity Review
Gary Robertson, Callan LLC

3:00 PM – 15 MINUTE BREAK

3:15-4:15 6. ISO 27000 Review
Scott Jones, Head of Investment Operations and Analytics
A. Introduction
B. Executive Session

FRIDAY, DECEMBER 4, 2020

9:00-10:00	7.	Approaches to the Current Macroeconomic Environment *Patrick Dimick, Senior Portfolio Strategist, Bridgewater Associates* *Joel Whidden, Head of Sales – Global, Bridgewater Associates*
10:00-11:00	8.	Performance Measurement – 3rd Quarter *Paul Erlendson, Callan LLC* *Steve Center, Callan LLC*

11:00AM – 15 MINUTE BREAK

11:15-12:00	9.	FBI Cyber Risk *Frank Reid, Special Agent, FBI*

LUNCH – 12:00PM - 1:15PM

1:15-2:00	10.	Fixed Income Presentation *Victor Djajalie, State Investment Officer* *Casey Colton, State Investment Officer*
2:00-2:30	11.	Liquidity and Risk Management *Shane Carson, State Investment Officer*
2:30-2:45	12.	Investment Actions Action: Amendment to IAC Contracts Action: Custody Contract Action: ARMB Actuary Audit Procurement *Zachary Hanna, Chief Investment Officer*

XI. **Unfinished Business**
XII. **New Business**
XIII. **Other Matters to Properly Come Before the Board**
XIV. **Public/Member Comments**
XV. **Investment Advisory Council Comments**
XVI. **Trustee Comments**
XVII. **Future Agenda Items**
XVIII. **Adjournment**

NOTE: Times are approximate, every attempt will be made to stay on schedule; however, adjustments may be made.

State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD
MEETING

Videoconference

MINUTES OF
September 17-18, 2020

Thursday, September 17, 2020

CALL TO ORDER

CHAIR ROB JOHNSON called the videoconference of the Alaska Retirement Management Board (ARMB) to order at 9:00 a.m.

ROLL CALL

Nine ARMB trustees were present at roll call to form a quorum.

Board Members Present
Rob Johnson, *Chair*
Norm West, *Vice-Chair*
Gayle Harbo, *Secretary*
Lorne Bretz
Commissioner Lucinda Mahoney
Commissioner Kelly Tshibaka
Bob Williams

Board Members Absent
None

Investment Advisory Council Members Present
Dr. William Jennings
Dr. Jerrold Mitchell
Ruth Ryerson

Department of Revenue Staff Present
Zachary Hanna, Chief Investment Officer
Pamela Leary, Director, Treasury Division
Mike Barnhill, Deputy Commissioner
Kayla Wisner, State Comptroller

Scott Jones, Investment Operation and Analytics Head
Stephanie Alexander, Board Liaison
Steve Sikes
Michelle Prebula
Grant Ficek
Sean Howard
Shane Carson
Victor Djalalie
Ryan Kauzlarich
Hunter Romberg
Tina Martin

Department of Administration Staff Present
Kevin Worley, Chief Financial Officer, Division of Retirement & Benefits
Ajay Desai, Director, Division of Retirement & Benefits
James Puckett, Deputy Director, Division of Retirement & Benefits
Christina Maiquis

Consultants, Invited Participants, and Others Present
Stuart Goering, Department of Law, Assistant Attorney General
Paul Erlendson, Callan LLC
Steve Center, Callan LLC
Avery Robinson, Callan LLC
Jonathan Gould, Callan LLC
Jeff Shields, J.P. Morgan
James McCandless, UBS
Jeff Maguire, UBS
Daniel Murray, UBS
Scott Young, Buck
David Kershner, Buck
Ric Ford, Buck
Paul Wood, GRS
Ken Mehlman, KKR
Dan McLaughlin, KKR
Sanjay Gupte, Sagitec
Kimm Nasser-Fenn, Linea Solutions
Lawrence Taylor, Brandes
Brent Woods, Brandes
Rob Gillam, McKinley Capital
John Reynolds McKinley Capital
Sonya Park, State Street Global Advisors
Heather Apperson, State Street Global Advisors
Alysia Jones, Public
Robert Schroeder, Public
Richard Farnell, Public

Nils Andreassen, Public
Bob Mitchell, Public
Tom Brice, Public
Rose Foley, Public

PUBLIC MEETING NOTICE

Board Liaison MS. ALEXANDER confirmed that public meeting notice requirements had been met.

APPROVAL OF AGENDA

MR. WEST moved to approve the agenda. MS. HARBO seconded the motion.

CHAIR JOHNSON requested the inclusion of a section called "Election and Announcements" that would be discussed after the approval of the agenda, as well as adding action items regarding delegation of authority for the CIO, after Item 19.

With those add-on's, the agenda was approved.

ELECTION AND ANNOUCEMENTS

COMMISSIONER MAHONEY announced MR. HANNA has been appointed as the CIO for the Division of Treasury, which is responsible for managing the ARMB assets. CHAIR JOHNSON suggested an agenda modification to remove the word "acting" as it appears throughout the agenda regarding the CIO. He also welcomed MR. MOEN, who replaces MR. BRICE as trustee.

CHAIR JOHNSON announced the departure of former CIO MR. MITCHELL and read a letter sent to MR. MITCHELL thanking him for his 22 plus years of service to the ARMB.

CHAIR JOHNSON also announced the pending departure of MS. ALEXANDER and read a letter sent to MS. ALEXANDER thanking her for her service as liaison to the ARMB and her careful, diligent, and patient work with the Board.

CHAIR JOHNSON also read a letter sent to MR. BRICE thanking him for his eight years of service as a two-term Trustee for the ARMB.

CHAIR JOHNSON thanked MS. HARBO for her diligent service on the Retiree Health Plan Advisory Board; she was replaced earlier in the year by MR. BRETZ.

CHAIR JOHNSON announced the need to elect a Vice Chair which was vacated by MR. BRICE.

MS. HARBO nominated MR. WEST. MR. WILLIAMS seconded the motion. With no objection, MR. WEST was elected Vice Chair.

PUBLIC/MEMBER PARTICIPATION, COMMUNICATIONS AND APPEARANCES

CHAIR JOHNSON stated that it is now time for members of the public who wish to make a presentation to the Board to participate and provide their thoughts. There is a three minute limit on all comments.

MR. ANDREASSEN introduced himself as the executive director of the Alaska Municipal League. He is working with and on behalf of 165 cities and boroughs across the state, 64 of which are PERS employers. He recognized the good work of the ARMB in fulfilling its statutory obligations. He wanted to encourage the Board, legislature, and state to fully fund additional state contributions and work together toward improving the past service debt.

MS. ALEXANDER introduced MR. SCHROEDER.

MR. SCHROEDER, who has been a Juneau resident for about 40 years and a PERS recipient stated that 350Juneau has asked the Board to perform a climate risk assessment for all its investments and to divest from its fossil fuel holdings. He found that the Board was not transparent regarding the information they provided about fossil fuel holdings earlier in the year. He stated that they identified seven areas of risk which are as follows: Transition risk which happens when governments institute a carbon tax or cap and trade which would lower asset values; Stranded asset risks where about two-thirds of proven fossil fuel reserves will never be brought into production; Litigation risk which targets companies responsible for high levels of greenhouse gas emissions; Divestment risk which drives down asset price values; Product pricing risk where renewable energy sources become less expensive than burning carbon for power generation; Fiduciary neglect risk – where, as Board members, you may be found individually culpable if investment decisions are politically based on loyalty to the oil industry; and Climate change denier risk where fiduciary responsibility does not allow the Board to act on their personal beliefs in making investment decisions. He asked that the Board come clean and start to wash the oil off their hands.

CHAIR JOHNSON asked MR. SCHROEDER if he was aware of the discussion on ESG and investments at the last Board meeting. MR. SCHROEDER stated that he was familiar with it but did not listen to the full report.

MR. FARNELL, a resident of Juneau who receives a pension from PERS, and is also on the board of 350Juneau stated that he had a fiduciary message for the Board. He stated that one of the primary fiduciary arguments for staying invested in fossil fuels has been the historical performance of the companies which provide balance in the portfolios and that they hold their value over long market cycles due to the world's dependence on carbon for energy. Due to companies experiencing increased pressures with lower renewable energy costs, race to develop new energy technologies, and dozens of climate change lawsuits against major oil companies, it's unlikely the fossil fuel industry will return to the performance of the past. He stated that should the Board move to divest from the energy sector, future pension recipients of these funds will see the leadership and foresight exercised by the Board in protecting the value of their investments.

APPROVAL OF MINUTES

MR. HIPPLER moved to approve the minutes of the June 20-21, 2020 meeting of the ARM Board. MS. HARBO seconded the motion.

With no objections, the minutes were approved.

STAFF REPORTS

1. RETIREMENT & BENEFITS DIVISION REPORT

A. Buck Consulting Invoices

KEVIN WORLEY, CFO, presented the Buck Consulting invoices and briefly explained the June 30th quarterly report showing items conducted and amounts paid.

B. Membership Statistics

C. DRB UPDATE/Legislation Summary

MR. WORLEY stated that there is a decrease in the amount of active membership in PERS and TRS due to the end of the school year. He reported that there is a slight increase in the retirement counts for PERS and a little decrease in TRS.

D. Modernization Update

MR. DESAI stated that since the introduction of the project management team from Linea Solutions they have continued to work on the RFP for an enterprise-wide system development company. DRB signed an agreement with Sagitec Solutions, a global technology solutions company. The total price of the agreement is about $24.9 million for implementation plus one year of the warranty period. In July a contest was held among the DRB staff to choose the name of the project which is ultimately the name of the new system. The winning name is BEARS, which stands for Benefits and Retirement Systems. The project is taking shape and is expected to be complete by October of 2023.

MR. GUPTE, Director of Sagitec Solutions explained that Sagitec is a U.S. based software solutions company founded in 2004. They mainly focus on public sector implementation projects and have 13 offices across four countries, nine of which are in the U.S. They have had 26 successful pension projects in the U.S. and focus on providing software solutions that are mainly for benefits administration, including pensions and unemployment insurance. He stated that as other technology features become available, their solutions make it very easy for their clients to integrate those new features into their solution.

MR. WILLIAMS asked in reference to Empower, as the new system is being implemented, should they expect a reduction in the 17-basis-point recordkeeping fee. MR. DESAI said that they are two completely different systems. Empower is managing the DC Plans' benefit administration, the enterprise-wide system is basically for the operational needs mainly for the DB Plans as well as help lines administration, health eligibility and recordkeeping for the employees.

2. TREASURY DIVISION REPORT
A. ARMB FY22 Budget
Action: FY22 ARMB Budget Proposal

MS. LEARY stated the action memo regarding budget was presented to the Operations Committee and recommends the Board adopt the FY2022 proposed budget with the understanding that components will be subject to appropriation by the OMB and the legislature. CHAIR JOHNSON suggested that this be moved forward following the conclusion of the Operations Committee report.

3. CALENDAR/DISCLOSURE

MS. ALEXANDER stated the disclosure memo is in the packet, along with a new communications memo which documents the emails and hard-copy letters received that are addressed to the Trustees. The attached calendars includes the remainder of the 2020 calendar and the 2021 calendar.

4. CIO REPORT

MR. HANNA stated that the current market will present some challenges, most significantly thinking through forward earnings in our asset allocation. He said that COVID almost immediately resulted in U.S. government bonds falling below 100 basis points and all indications are the yields will remain low for some time. Equity rebound with tech stocks accounting for most of the gains. This will all likely result in earnings challenges and a wider than normal dispersion of potential outcomes. He said that the investment team will work hard to sort through these issues and present the Board with their best advice being mindful of the ARMB's portfolio structure and cost focus. He turned to the CIO report in the Board packet on page 82 and directed the Board to the request of a precious metals option to the DC Plans. He stated that the DC Committee will be recommending a brokerage window for DC Plans. He turned to the watch list and stated there are currently no managers on the watch list and staff does not recommend any additions. With respect to transactions made with delegations of authority to the CIO, he stated the first transaction was a private equity funding and was completed in July with a $50 million commitment to Resolute Fund V. The Jordan Company, the general partner for this fund is a manger in good standing with the ARMB and this is the ARMB's third direct investment with the group. The next transaction was a contract amendment made in August with Crestline to allow for $225 million of additional opportunistic investments. MR. HANNA stated between June and August they executed a rebalance at year end, the increase in the equity target resulted in selling $210 million in core fixed income versus domestic equities. On July 8th the annual state assistance payment of $343.7 million was received into the system and was invested with $65 million in core fixed income, $147 million in domestic equity, and $132 million in international equity. On July 17th they rebalanced the international equity allocations and in late August raised $92 million from domestic and international equities to cover the outflow of the monthly pension payments. Overall, just under $400 million was liquidated from fixed income and invested into equities during this period. He stated four internal rebalance transactions were conducted over this period to equalize relative allocations across the various plans.

5. FUND FINANCIAL PRESENTATION

MS. WISNER stated that as of September 16 the total for nonparticipant-directed assets was $28.3 billion with fiscal year-to-date income of $1.7 billion and a net contribution of $113.8 million. She also stated that as of September 16 the internally managed assets totaled approximately $14.2 billion.

MR. HIPPLER stated that during public comment it was suggested that at any given time we did not have a good idea of the amount of equities that we have. He asked how accurate that information would be.

MS. WISNER stated that she believed that was in regard to alternative investments, meaning oil, energy - those types of investments. The public equities and fixed income securities are valued every day.

MR. HANNA added that most of the exposure to fossil fuels is through public market investments and those updates come in daily. The alternative investment information is available quarterly.

MR WORLEY directed Board members to his report in the meeting packet, and said the additional state contributions including $203.6 million for PERS, $134.9 million for TRS, and $5.1 million for JRS were received in July. He also stated that they continue to report the participant-directed disbursements and have taken into account the CARES Act distributions.

TRUSTEE REPORTS

6. CHAIR REPORT

CHAIR JOHNSON said that he was involved in the advisory selection committee regarding the CIO and appreciated the process and commends the decision that was made. He stated he would report on other matters that he has been involved in during the various committee reports.

7. COMMITTEE AND LEGAL REPORTS

A. AUDIT COMMITTEE

CHAIR JOHNSON stated that the Audit Committee met yesterday morning and heard reports from KPMG. The one takeaway was a discussion on what action, if any, should be taken regarding gains reported since March, to address the lag issue that has been discussed a number of times. The question to KPMG was whether there should be a modification to the report regarding this or whether it reaches the level of materiality. If next time around there’s a reduction, do they need to make that change in the report. He stated that the matter, along with auditing standards and best practices is being discussed at the leadership level. He stated the committee also heard reports from MR. WORLEY and MS. HELMICK regarding DRB audits of some of the employers and noted COVID restrictions have impacted field audits.

B. ACTUARIAL COMMITTEE

MR. WEST said the purpose of the meeting was to review, adopt, and approve the calculation of the additional contribution rate to be made by the state for each plan. He explained that an employer participating in the plans pay a percentage of total payroll that is specified by statute, but that amount is not necessarily the percentage required to meet the benefits promised to participants, so the state, through the legislature, funds the differences in what's known as an additional contribution.. He also said they reviewed the expected or possible impacts COVID would have on the health plan. The healthcare actuary told the committee that a lot of expenses did not occur because a lot of discretionary medical expenses or procedures were postponed by government action, which appears to have driven down healthcare costs. He stated that there is a potential for additional costs including both immediate costs of dealing with COVID, as well as longer-term costs of care of individuals who were affected. He said they will have more of an idea of what actual expenses are going to be at the next meeting. He also said that a resolution was passed concerning hiring of an auditor of the actuaries. <u>On behalf of the Actuarial Committee, MR. WEST moved to adopt the resolution to direct staff to procure an actuarial audit of the actuaries as required by law. No second was required.</u>

A roll call vote was taken, and <u>the resolution was passed unanimously.</u>

C. DEFINED CONTRIBUTION PLAN COMMITTEE

MR. WILLIAMS said the DC Committee held a meeting yesterday and discussed health reimbursement accounts. The slide presentation showed a slide that said members had to retire directly into the plan, members were then worried about having to take health insurance and pay full premiums if they were under 65. MR. PUCKETT stated at the meeting that they have to retire directly into the plan, but they can defer until they reach 65. MR. WORLEY and MR. DILG gave an overview of how DC members' HRA accounts gain interest. MR. WILLIAMS said that 3 percent of the average of all plan employees goes in every year, but it also earns interest. The interest that it earns, which is at the overall ARMB rate, was recently calculated and will be calculated on annual basis.

MR. WILLIAMS stated there was also an update from Empower that included a discussion on members' interest in pulling money from a particular fund within their Empower account. Currently, the money comes out of all of the funds. He stated an update regarding Empower's timeline for making those withdrawals from a particular fund is planned for the next meeting.

MR. WILLIAMS stated there was also an action item for a cash investment for the Stable Value fund. He also reported that the committee looked at three different entities that could offer a brokerage option and the recommendation from staff and Callan was to go with the Empower brokerage account. MR. WILLIAMS explained the two recommendation coming from the DC Committee that will be presented to the Board through MR. HANNA during Agenda Item 20. Investment Actions/ Information Items.

D. OPERATIONS COMMITTEE

CHAIR JOHNSON stated that an election was held for a new Chair and he was elected as Chair of the Operations committee. He also said that MR. JONES updated them on Middle Office issues with cyber security which will be discussed more in-depth at the December meeting. He said MS. LEARY led a discussion regarding the final budget for FY2020 and the FY2021 budget approved by legislature. Ultimately the committee unanimously approved forwarding an action to the Board regarding the adoption of the FY2022 ARMB budget proposal and the committee recommends to the Board that they adopt the budget proposal advanced.

MR. BRETZ asked why there is such an increase in the projected external public investment fees for 2021. MS. LEARY stated there is actually a decrease in the amount that is being requested for authorization for the budget for OMB purposes but that is not the intention as you can see from the management fee report.

CHAIR JOHNSON suggested they go back to the motion that was made on behalf of the Operations Committee to adopt the FY2022 ARMB budget proposal as advanced by that committee.

A roll call vote was taken, and the motion was passed.

CHAIR JOHNSON also stated that there was a discussion led by MR. GOERING regarding indemnity and defense of Trustees in actions relating to the Board. He said that the discussion was a reminder that they are all fiduciaries and have obligations to exercise those relations appropriately, that the state stands by statutorily to indemnify them for those kinds of actions. He also spoke of how letters come in from the public and suggested a further discussion on how the ideas and thoughts that are presented to the Board should be handled.

E. RETIREE HEALTH PLAN ADVISORY BOARD

MR. BRETZ had nothing to add to his written report on the RHPA board meeting. He did remind the Board about the open enrollment period for retirees with the Dental/Vision/Audio plan, which begins on Tuesday, October 20 and closes Wednesday November 25th. He stated that it will be a passive enrollment meaning if no action is taken their plan will remain the same.

8. LEGAL REPORT

MR. GOERING stated that all the litigation matters he has been tracking and reporting on are only tangential to their work and none of them have particular status. He also noted that a public participant mentioned a case involving the Tax Credit Bond Corporation, which is not directly applicable to the Board's work, but that it will likely have an impact on the Pension Obligation Bond Corporation. He said the state is considering whether or not to request a rehearing on that decision. He also mentioned the changes in the management of the Department of Law, but added that those changes will not affect the quality of representation the Board gets.

9. ACTUARIAL RESOLUTIONS - FY22 CONTRIBUTION RATE SETTING

CHAIR JOHNSON stated there are a series of resolutions for motion, Resolutions 2020-07 through 09 relating to PERS, Resolutions 2020-10 through 12 relating to TRS and 2020-13 relating to the

National Guard. MR. WEST directed the Board to a summary letter from Buck dated August 20th to Ajay Desai, Director of DRB that lays out the percentages.

INFORMATION: HISTORY OF PERS/TRS EMPLOYER CONTRIBUTION RATES

ACTION: Relating to FY22 PERS Contribution Rate - Resolution 2020-07

CHAIR JOHNSON stated:2020-07 states that the fiscal year 2022 actuarially determined contribution rate attributable to employers participating in the PERS is set at 30.11 percent, composed of the contribution rate for defined benefit pension 20.89 percent, the contribution rate for post- employment healthcare of 3.12 percent, and the contribution rate for defined contribution pension of 6.10 percent.

ACTION: Relating to FY22 PERS RMMI Contribution Rate Resolution 2020-08 Relating to FY22 PERS ODD Contribution Rate Resolution 2020-09

CHAIR JOHNSON said for 2020-08, also relating to PERS, the resolution states: for fiscal year 2022 employer contribution rate for the retiree major medical insurance for the Public Employee's Defined Contribution Retirement Plan is set at 1.07 percent. And under 2020-09 the resolution calls for the fiscal year 2022 employer contribution rate for public employees' occupational death and disability benefit rate is set as 0.68 percent for peace officers/firefighters, and at .31 percent for all of the Public Employee's Defined Contribution Retirement Plan employees.

A roll call vote was taken, and Resolutions 2020-07, 08, and 09 were unanimously adopted.

ACTION: Relating to FY22 TRS contribution Rate - Resolution 2020-10; Relating to FY22 TRS RMMI contribution Rate Resolution 2020-11 Relating to FY22 TRS ODD Contribution Rate Resolution 2020-12

CHAIR JOHNSON stated that the next motion that will be advanced by the committee is the consideration for adoption of Resolutions 2020-10, 11, and 12 relating to TERS and asked MR. WEST if he would make the motion.

MR. WEST so moved the motion.

CHAIR JOHNSON explained that 2020-10 calls for fiscal year 2022 actuarially determined contribution rate attributable to employers participating in the TRS is set at 31.85 percent, which is composed of the contribution rate for the defined benefit pension of 22.51 percent, contribution rate post-employment healthcare of 2.98 percent, and the contribution rate for defined contribution pension of 6.36 percent. He further explained that Resolution 2020-11 for fiscal year 2022 employer contribution rate for the retiree major medical insurance for the Teachers' Defined Contribution Retirement Plan is set for 0.83 percent, and Resolution 2020-12 calls for the fiscal year 2022 employer contribution rate for teachers' occupational death and disability benefit rate is set as 0.08 percent for all Teachers' Defined Contribution Retirement Plan employees.

A roll call vote was taken, and Resolutions 2020-10, 11, and 12 were unanimously adopted.

ACTION: Relating to FY22 NGNMRS Contribution Amount Resolution 2020-13

MR. WEST stated that there is a resolution concerning the contribution rate to the Alaska National Guard and Naval Militia Retirement System and that they are calculated in a different way. He explained it is a dollar amount contribution rather than a percentage of total payroll type contribution.

MR. WEST read Resolution 2020-13, stating that the fiscal year 2022 contribution amount for the State of Alaska, Department of Military and Veterans Affairs to the Alaska National Guard and Naval Militia Retirement system is set at $737,551.

A roll call vote was taken, and Resolution 2020-13 was unanimously adopted.

INFORMATION: JRS CONTRIBUTION

MR. WEST stated that in the packet is information regarding the JRS contribution amount which has another set of rules. He explained that it does not require any action by the Board because it works differently than the others. Their rates are established by the Commissioner of Administration based on some of the same processes.

10. "IS VALUE DEAD?"

MR. HANNA introduced Brandes Investment Partners by explaining that the value investment style has underperformed the growth investment style of the past decade with significant additional underperformance in 2020 with the tech-dominated stock market rebound. He went on to introduce MR. TAYLOR, client portfolio manager and MR. WOODS, CEO to give an update on the performance.

MR. WOODS explained that he was going to focus on the style of value investing. He said that this past year has been a train wreck for value as a style. Referring to Slide two he pointed out that there are a number of periods in which value has done better and periods where growth has done better. Referring to Slide 3 he said that over the past five years, value has dramatically underperformed in every geography and across capitalization and has been undermined for the past five to 10 years regardless of where they are investing. He also stated that value has lagged growth across all geographies in the year ending in June, anywhere from 19 to over 30 percent. He said that the driving factor for this has been businesses and industries changing as a result of technology which has been an important fundamental factor that has driven the performance of the various portions of the benchmark over the last 10 years. He also said that looking at Slide 6 it shows that there has been a big shift in money from active to passive over the past 10 years or so. He said that there has been positive earnings growth outside the U.S. where economic conditions have not been as robust as in the U.S., but there has been growth in earnings of value companies over the last decade. He stated the P/E multiple has gone down on value stocks, and has gone up on growth stocks. He said that the key reason has to do with interest rates. He digressed into valuation saying that fundamental investors in the market care about how companies generate cash flow. A key component of the way market thinks about business is to put a price on current earnings and as investors, they are trying to come up with what the appropriate price-to-earnings ratio. They look at what the current clean earnings of the business or market they are looking at, they look at discount rates which has two components, one is a risk-free rate, then the risk premium for the company or the asset class. He stated that there is no question that the global economy has changed over the past decade and will continue to change going forward. He said that a lower risk-free rate means the lower discount rate for value in companies, and that lower discount rate means a higher P/E and a lower earnings yield. He said that he personally thinks that rates will remain low for a long time but if an uptick in rates occur and move from the 6 percent discount back up to 8 percent, there would be a reversal of what has taken place over the last decade and it could be very beneficial to value.

MR WILLIAMS stated that the Feds are saying they are going to keep the rates near zero through roughly 2023, that they are concerned about the economy, and that's going to do it. He said it is an indication that value is going to struggle at least through 2023 and asked if there was an upside to value possible.

MR. WOODS stated that the drop in interest rates has changed the way the market prices the various equities. He also said that it makes sense to maintain exposure to value and that to some degree maintaining exposure to value is probably prudent because there is a chance that interest rates will rise.

MR. WILLIAMS told MR. WOODS that if he were to summarize his presentation he would ask "Is value a dead horse" "No, but it's a sick horse that maybe has pneumonia, that can't stand up, but it may get better and may stand up again. Maybe it's not going to gallop, but it might get to a trot. Is that kind of accurate?"

MR. TAYLOR stated that he would go for a mule analogy in that he thinks we are a sturdy, slow mule that has a good footing, and we are currently walking through a very uncharted path that does not have good footing. He also suggested it may be more of a sturdy, surefooted mule that had not gone very fast in the last decade, but has the chance to keep going forward.

MR. HIPPLER asked MR. WOODS if he thought value is fairly priced right now or was he contrarian and more bullish on value than he thinks the market is, and does he disagree with the market.

MR. WOODS stated that he thinks the value portion of it looks quite attractive, that there are numerous equities that are very expensive, and they are not interested in owning. He said he thinks that the market is a bit too pessimistic about the value of the benchmark. It has been underperforming and people don't want to own it, but he believes that markets are generally efficient with pockets of volatility that provide great opportunities.

MR. TAYLOR stated that over the last 300 years there have been a number of these growth structural changes including the 1700's with the industrial revolution in factories, the early 1800's with steam, the late 1800's with steel, and the early 1900's with oil and mass production. He stated in all of these periods' growth has dramatically outperformed value, but all that value tends to outperform growth over those long periods of time as those structural shocks are absorbed into businesses and economies.

11. INTERNATIONAL EQUITY MANDATES UPDATE

MR. TAYLOR stated that value has lagged the growth a bit, but noted several updates since the report was submitted. He said the portfolio has returned 5.2 percent versus 4.3 percent for ACWI ex-U.S., and 4.5 for ACWI ex-U.S. value in August. September is up 1.2 percent versus .4 and .1, so year-to-date the portfolio is down about 13.8 percent versus 13.9 percent for value, with an account value of about $282 million. He said concerns over Brexit over time has allowed them to find companies that were undervalue to them, but some of those have bounced back such as Kingfisher, which is a European version of Home Depot. Kingfisher was up almost 20 percent so far in the third quarter. He stated that the portfolio top 10, meaning those with the largest allocation in the portfolio, are names that probably do not come to mind in terms of value. He said it is comprised of several pharmaceuticals, building products, some food, staples and a little bit of oil and gas and consumable fuels, which are integrated oil companies.

MR. TAYLOR explained that we are in a similar area as we were in the tech bubble when value has been down that it can be spring-loaded for a relatively good performance and then value does well. He then turned the presentation over to MR. WOODS.

MR. WOODS said that they rotated the portfolio adding to things that they liked and some new things. He said that when they aggregate all of the investments and look at them on a combined basis, the portfolio is very attractive. He went on to say that they appreciated the opportunity to speak with the Board today and hope that they can be of assistance going forward.

MR. HANNA said Brandes is part of a style-neutral pair with growth manager Baillie Gifford and pointed out that both managers have materially outperformed their respective style indices. He also made several observations regarding the dynamic between growth and value being different than it has been historically, and growth faces some additional headwinds with regulation and deglobalization impacting tech and growth more than they do value. He said growth is very expensive, while value is quite cheap and has high yields and more consistent earnings. In response to MR. WILLIAMS' question about Fed impact on growth and value, MR. HANNA said both markets were down broadly today, noting the percentages of the Russell 3000 growth index versus the Russell 3000 value index. He said that's just one day, but that it does point towards how both sides are priced at some level.

12. UBS REALTY INVESTORS LLC & UBS FARMLAND INVESTORS LLC

MR. HANNA introduced this presentation by explaining that there are two things to keep in mind, the first being the need to make each asset class work harder during a time when both earnings and yields are likely to be lower and diversification more important than ever. The second is an increased risk of higher inflation per an announcement from the Feds explicitly targeting higher inflation. He stated that the next presenter, UBS, manages two investment mandates for the ARMB, a private real estate separate account of $628 million and a private farmland separate account of $596 million. They are also in the process of integrating the ARMB's other farmland separate account of $286 million. He then introduced MR. MAGUIRE and MR. McCANDLESS.

MR. MAGUIRE reported that in over 28 years of actively investing in real estate on behalf of ARMB they have produced a gross return of 9.6 percent which comes to an 8.91 percent annualized net total return since 1998. He also stated that at the end of the second quarter the account consisted of 12 assets totaling just under $628 million in value and an average property of $52 million which includes apartment complexes, industrial, office, and retail. He said that the account they manage on behalf of ARMB is diversified with heavy emphasis in the industrial sector which is the real strength of the portfolio. There is room within the apartment side to deploy additional capital. Geographically the account has more emphasis in the West, strong exposure in the East, lighter in the South which have had somewhat volatile growth markets. There is relatively light exposure in the Midwest which is typically a challenging NCREIF region to invest. As far as the retail sector, it is underweight compared to ODCE. He also stated that the highlights of the separate account performance for the fiscal year that closed on June 30th shows a 6.24 percent net total return for that period. There were value gains driven by the industrial and apartment assets and we were able to reduce commercial lease rollover exposure by 30 percent. The focus for the current year is to maximize rent collections. He stated that because it wasn't easy for tenants to find another place to live due to COVID-19, keeping tenants was easy as well as increasing the rents in a very prudent and careful way to not attract adverse publicity. Attracting new tenants was a different story. They had to cut the asking rent to get people to come to the property.

CHAIR JOHNSON asked if there was a way to extend the scope of owner liability for COVID compliance issues.

MR. MAGUIRE stated that he was sure that would come, but that they are doing the best they can to be a responsible landlord. If there are plaintiff attorneys looking around for clients and potential cases, they will have to prove where the COVID was caught. That is why they make sure people coming in and out, visitors or employees, follow the rules which are clearly posted and enforced as necessary with either building security and/or building ambassadors. As far as the retail account with grocery-anchored centers, where retailers have their own entrance for customers, it is simpler than an enclosed mall or other enclosed building. The grocer anchors did unbelievable business due to COVID stocking. There are two very solid grocer anchors, Publix in Florida, the dominant grocer in that area, and Whole Foods in a suburban Boston shopping center.

MS. HARBO commended MR. MAGUIRE on renewing the leases on the two properties, one in California and one in Virginia for the office space, but asked if he was anticipating any problems in the future as people were getting used to working from home.

MR. MAGUIRE stated that there is a lot of uncertainty in the office sector due to people working from home and not knowing if people will return to the office space. However, they have seen a real change in the amount of square footage per employee, so offices are becoming increasingly densely packed, which is not the best situation in the age of COVID and people are going to be hesitant to be in that situation. Employers are going to have to provide employees with more square footage per employee. He feels that CBD office buildings will be more deeply impacted than suburban office locations due to public transportation issues, including elevators with a four-people-max per elevator. While suburban office buildings have maybe four to five floors and at the end of the day a person can take the stairs to get to the parking lot.

MR. WEST asked if it was correct that there were only two retail properties - one in Massachusetts and one in Florida. He also asked if there are any properties in central business districts in major areas that might end up being involved in some sort of rioting or looting event -- is there insurance in place to protect these properties?

MR. MAGUIRE stated that there are no true CBD office buildings in the separate account. The closed one is a building in northern Virginia that was acquired on January 1st and is kind of a transit node area. The other asset is in Glendale, California and in both cases no problems with any sort of protests, rioting or vandalism at either location. Should there be a problem, they are adequately insured.

MR HIPPLER asked if there were currently any federal laws that impact the ability in the residential sector to evict tenants?

MR. MAGUIRE stated the CDC issued some guidelines that impact evictions and they have to follow any state law mandates. They are careful about evictions, preferring to work with the tenants instead. He also stated that the collection rates from the residential tenants is in the 90th percentile in terms of tenants being billed.

MR. HIPPLER also asked how often the market value of the separate account properties are evaluated.

MR. MAGUIRE stated that they are appraised each quarter for each property.

MR. MAGUIRE introduced MR. McCANDLESS from AgriVest.

MR. McCANDLESS stated that he heads up the Farmland Investment unit for UBS. He said that the Midnight Sun portfolio, which is the name of the entity that holds title to the farmland properties has a current gross asset value of all the properties in that fund and in that portfolio is a little over $600 million, the farmland value is $593 million, and the cost of those properties is $366 million. There is a little over 97,000 acres, or 152 square miles in 113 different states and 67 of those properties grow over 25 major crops. The investment strategy for this portfolio is core diversification, which means the holdings in the property reflect the investment universe of farmland in the U.S. This portfolio is currently underweight in permanent crops and in vegetable crops - the target is 60-20-20 so there is room to grow. The efforts going forward this year are to emphasize acquisitions in the permanent crop space as they have a tendency to generate more cash returns than they do appreciation and bolster the cash return segment of this portfolio. These holdings are primarily in California, Idaho, Colorado and Arizona. One other point he made was that they distribute cash out of this portfolio every quarter, and since inception they distributed back a little under $200 million. Another thing they do with the portfolio is to renovate properties. Last year they renovated the apple orchards by changing the varieties to some of the newer, more popular varieties. They don't cut down the entire orchard, they do it in pieces - 38 acres here, 18 acres, 44, 14, 28 and so on, they focus on planting a higher price apple which takes about four years for the trees to produce, so there is some lag time between when the trees are planted or grated, and when they actually start to produce income. The leases on these properties are all participating leases so income is generated off the percentage of gross income from the sales of the produce. He also stated that a property in Texas sold for $9.9 million that was originally purchased for $3.3 million. The same thing happened with a property in Idaho, both sales were an unsolicited offer.

MR. WILLIAMS asked how the two properties were sold for the same amount - if it was just a coincidence. He also asked if any of the properties in the portfolio have been affected by the fires or hurricanes.

MR. McCANDLESS stated that both offers for the property were unsolicited, which they generally turn down, but in both cases, they kept coming back with higher offers and UBS felt it was a good opportunity to redeploy the money in other properties. As for the hurricanes and fires -- there is a grove in Florida that went through a hurricane which took down several trees in a 1,000-acre grove and is in the process of replanting those trees, most of which are back in the ground. As for the fires, there was a vineyard in the Carneros region of the Napa Valley that was affected by the fires, but the grapes had been harvested prior to the fires. Another problem with fires is smoke taint the grapes which affects their taste, and would be rejected for wine. This would impact the tenant which would then impact the return because those properties are leased on a percentage of gross income basis.

MR. ERLENDSON asked to what extent is access to water changing.

MR. McCANDLESS said new regulations were established in California that have favorably influenced the holdings in the portfolio because they are in excellent areas where there is excellent water which is reflected in some of the valuations in some of those irrigation districts. During the California drought, the California portfolio was one of the best performing segments of the entire portfolio due to the fact that the water is really good.

13. CONSULTANT EVALUATION OF REAL ASSETS PLAN

MR. HANNA introduced MR. ROBINSON and MR. GOULD of the Callan Group.

MR. ROBINSON said when Callan took over the consultant responsibilities, they went through an extensive portfolio structure review and strategic plan which resulted in several recommendations which they are in the process of implementing. He reminded the Board of the role of real assets and that they are in the portfolio for competitive returns, diversification benefits, and the income component. He stated that there are four main categories going up the spectrum from core, core-plus, value-added, and opportunistic, with most of the allocation focused on the core and core-plus. At this point he turned the floor to over to MR. GOULD.

MR. GOULD stated that the markets were in good shape at the end of 2019 aside from some issues in the retail sector, but overall, the market was strong. He said that COVID-19 has had a massive impact on real estate with the shelter-in-place and other economic shutdowns that have changed our lives and the way we go to work and shop. The two primary impacts of the real estate market have been rent collection and almost a complete halt of transaction activity. It makes valuations very challenging; appraisers don’t have a lot of comparable sales to work off of which impacts the entire market, but also, liquidity has dried up. However, with people shopping more and more from homes, industrial logistics is performing very well. He stated that the return impact so far has been not as significant. During the first quarter when the shelter-in-place started it was too early to know in terms of valuations, but in the second quarter we started to see some depreciation. As more transactions start to bounce back and people get a bit more clarity on what the overall impacts are towards the future and what the new normal is going to look like, we hope to see more clarity on how those returns will shake out. It really varies a lot by property type, with retail driving the negative returns in the second quarter. He said that vacancy has had a long-term decline coming out of the Global Financial Crisis and they have not quite up-ticked yet as a result of COVID, but it is expected to increase in the coming quarters. As far as NOI growth, it has been a cash hurt so far in the numbers, again, retail leading the way. There is a significant decline that occurred, but others have dropped as well, indicating that with lower rent collections in income, the ability to generate NOI is decelerating significantly. Transactions are starting to occur and a lot of them are driven on industrial and high-credit-quality tenants in place. A lot of buyers and sellers remain far apart with a wide bid/ask spread. Buyers are expecting a discount, given the pandemic and uncertainty, whereas sellers are still thinking of pricing back at the end of 2019 so there remains a sort of gulf between the two. He said that there is a lot more public market volatility that is attached to the REIT market, it dropped quite a bit at the beginning of the pandemic as the public equity markets fell. They have recovered, but have lagged the broader indices, indicating there is a lot of uncertainty regarding real estate. There still remains a discount from public market valuation compared to the implied NAV of the underlying assets. There is a trend of longer periods of a discount that vary by market and property type. He stated that in looking at the ODCE to see where the entry and exit queues are, he found that the exit queues were starting to tick up a little towards the end of last year which had to do with concerns of over pricing and the headwinds in retail. He also said a lot of investors were getting fully allocated to real estate and are now rebalancing.

MR. ROBINSON stated that the impact of COVID has not yet resonated through real estate, but that we know it is coming. He said in looking at the actual returns, while there is a timeframe where there was some underperformance, the portfolio has outperformed. He stated that diversification has certainly helped with this. He said that the portfolio has been outperforming the comparative NCREIF Total Index, which is something they like to see.

MR. WILLIAMS stated that he was surprised to see that it seemed more positive than what he expected due to everything with COVID. He asked what are the peers, are they comparing different things, or are they the same things?

MR. ROBINSON stated that the impact has not been felt. The values for the quarter for private real estate had already been established, so returns were positive for the private real estate market for the first quarter. The second quarter did not show a decline either. The core products were able to have a better sense of where they thought they should mark down their assets, because they have more occupancy and know their tenants better, and can make better assumptions. The non-core side has a lot more uncertainty because they are in the process of constructing buildings or leasing or re-tenanting. He said they anticipate that the broader market will catch up, and they will start to see the actual returns for the entire database go down a bit more.

MR. WILLIAMS asked if it was accurate to say that the portfolio is not in the lowest 25 percent of performers, and our returns may reflect the impact of COVID more so than some of the others in the database.

MR. ROBINSON stated that that was correct. He said there was a wide variance within the core space for the second quarter of 2020 and that the non-core space was even wider.

MR. WILLIAMS asked if it would be accurate to say that there will be above-median returns for one quarter and can we get an idea of how we are doing in terms of real assets by looking at the longer-term ones and seeing we are at or usually above the median in a lot of cases?

MR. ROBINSON responded yes, even in times of non-COVID, they prefer to focus more on the longer term because of the way the assets are valued. He moved on to infrastructure, explaining similar to real estate these assets are valued quarterly. He highlighted that the Board has two infrastructure managers and while there was consideration of consolidating due to the fact one was outperforming the other, they decided to stick with two and both are contributing, just at different times. Moving on to timberland, he said this has been somewhat of a disappointing asset class, within the market as a whole.

MR. ROBINSON reminded the board that they did a lot of work last year establishing a new plan and reviewed the strategic plan objectives. He said there is one mild recommendation – allowing your core separate account managers to utilize some leverage. The intent is that it will increase diversification and enhance returns, particularly in a low-interest-rate environment.

MR. HIPPLER asked if they are able to measure the theoretical decrease in risk form diversification versus the theoretical increase in risk from increasing leverage?

MR ROBINSON stated that it is hard to quantify the benefits of the diversification versus the use of the leverage metrically.

MR. HIPPLER then asked when the real asset portfolio returns are lagging below the index, is it because the index includes leverage, or is part of that because the index includes leveraged returns?

MR. ROBINSON stated that it is because almost all of the index or your peer groups includes leverage. He also stated that the exception is the NCREIF index, which does not include leverage, but added most benchmarks do. He said the peer group includes leverage, and not using leverage makes you more of an outlier.

MR. HIPPLER asked what enhancements would a 20 or 30 percent leverage have provided, if you could look back over the last three, five and seven years?

MR. ROBINSON said he did not have that information, but that they could definitely get back to you on that.

CHAIR JOHNSON asked if enhanced benefit from leverage exists until you get above 30 percent.

MR. ROBINSON stated No, there is consistent benefit from leverage below that with respect to core real estate.

MR. HIPPLER stated that slides on pages 20 and 21 are compared to non-leveraged funds, so leverage is not a key difference on those slides and that the portfolio is lagging for reasons other than leverage. MR. ROBINSON said that was correct, but also slides 20 and 21 reflect timber and farmland and we are recommending you consider leverage for the core real estate and not for farmland and timber.

MR. HIPPLER asked if it was possible for a portfolio of this size to invest in an index such as

NCREIF and if there was an index fund that they can invest passively, or do they need to be active to make the index?

MR. ROBINSON said there is not an index option for these on the private side.

MR. WILLIAMS asked if they were actually seeing different strategies between the two managers and whether a negative correlation exists.

MR. ROBINSON said the consideration to consolidate was driven by a variety of factors, including fees, but that both staff and Callan concluded that for infrastructure it's best to keep that diversification broad and use two managers. It was less about true inverse correlation and more about broad diversification.

14. REAL ASSETS FY21 ANNUAL PLAN

CHAIR JOHNSON introduced MR. SIKES.

MR. SIKES stated that he will be recommending some changes to the portfolio, but the FY 2021 plan is a stay-the-course approach. The portfolio is performing consistent with expectations since the COVID pandemic began. He stated that it was not a surprise given the primarily core nature of the portfolio which should provide protection against higher-risk market conditions. He said that as of June 30, the real asset portfolio made up 13.6 percent or ARMB's portfolio with investments in real estate, farmland, timberland, infrastructure and energy. The role of the portfolio is to diversify, provide current income to help pay benefits, provide inflation hedge, and to provide attractive total returns. The return expectation is to have net returns between stocks and bonds over rolling six-year periods. He stated that if the economy recovers and REITS will remain low, the real assets portfolio should do relatively well going forward. He said the Board approved a number of changes at the June meeting that are expected to improve the cost and fee structure of the portfolio and also refine the strategic focus. He summarized the changes as follows: ARMB's open-end real estate fund position is being consolidated with the BlackRock Core Property Fund; the Sentinel Real Estate separate account was allocated an additional $125 million; ARMB's two farmland separate accounts are being consolidated with UBS; and ARMB's two timberland separate accounts are being consolidated with TIR. He said that value of the portfolio was just under $1.3 billion as of June 30 with approximately 50 percent of the portfolio in core separate accounts representing 15 properties. An additional 27 percent is in core open-end funds, 6 percent is in non-core funds and 18 percent is in domestic publicly traded REITs. He said that the UBS and Sentinel separate accounts have consistently outperformed the NCREIF ODCE Index over longer time periods and the BlackRock Core open-end fund has also had a good track record inside of 10 years. These portfolios are the foundation of the real estate portfolio and create a well-diversified exposure to core real estate built around current income. He stated that for the fiscal year 2021 plan for real estate he has two recommendations. The first is to add $20 million to the UBS allocation to address capital expenditure items for the current properties in FY 2021 budget. The second is to allow separate account managers to employ prudent amounts of leverage in the management of the portfolios, specifically a maximum of 30 percent leverage at the portfolio level and 65 percent leverage at the property level. This is due to the dramatic decline in interest rates and expectations that leverage will increase returns and add diversification to the portfolio. He said ARMB

currently employs leverage as part of its open-end fund investments, non-core investments, and REIT investments and this recommendation is to add leverage to the separate account portfolios managed by UBS and Sentinel.

CHAIR JOHNSON asked for a reminder of what the current allowances are regarding debt, the use of leverage in the separate account section.

MR. SIKES stated that the current guidelines do allow leverage in the separate accounts in a fairly unique form that has never been used. He said it allows debt on pools of assets which requires additional Board approval. In the past there was talk about not doing single mortgages, which is what he is proposing, but rather issuing debt on a pool of account assets.

CHAIR JOHNSON stated that in his recollection with ASPIB is that there was opposition to it - the Board based it on hypothetical problems.

MR. SIKES said that every year he would ask the managers what improvements they would recommend and every year they have wanted to put leverage on the properties. This year with the move in interest rates, there is a decent spread between where he thinks the Board can borrow and where he thinks they can invest.

MR. SIKES explained that for FY 2021, the plan is to focus on a smooth transition from moving the Hancock Farmland portfolio to UBS, which has an additional $100 million in allocation that it will be able to invest. The only change being recommended is to adjust the crop type weights back to 80 percent row, 20 percent permanent target from the current 60/40 weight. The portfolio is currently 86 percent row, 14 percent permanent, so the 80/20 is more consistent with the current profile. There are no changes recommended in either timberland or infrastructure.

CHAIR JOHNSON asked if there were any questions for MR. SIKES before moving to the action item.

MR. HIPPLER asked if any members of the Investment Advisory Council had any comments on leverage of the real estate portfolio.

DR. MITCHELL said leverage depends on the person or the institution using the leverage and that the managers that the ARMB has know what they are doing. He stated that it would be a good idea to approve the recommendation.

MS. RYERSON said she agreed with the previous comments and it will help improve our returns.

CHAIR JOHNSON asked if MR. SIKES recommendations have the full support of Callan, as real estate advisors.

MR. SIKES said they do.

MS. ALEXANDER said DR. JENNINGS wrote in the comments that he supports the recommendation

and former IAC member GEORGE WILSON long thought it's something the ARMB would benefit from.

MR. HIPPLER asked if the Board should consider leverage in other areas and where do the benefits of leverage end.

MR. SIKES said he did consider including leverage in timberland and farmland, but given the somewhat low returns for timberland and lack of a tangible kind of contractual cash flow yield, it did not have the appeal as it does with real estate. He said he is thinking about leverage on the overall farmland portfolio, but that he is not ready to recommend that to the Board at this time.

Adoption: Real Assets FY21 Plan & Policies Discussion

ACTION: Real Assets FY21 Annual Plan Resolution 2020-14
MR. SIKES recommended the ARMB approve Resolution 2020-14, which adopts the real assets annual investment plan for fiscal year 2021. <u>MS. HARBO moved to adopt the Resolution.</u> <u>MR. WEST seconded the motion.</u>

A roll call vote was taken, <u>Resolution 2020-14 was adopted unanimously.</u>

ACTION: Revised Investment Guideline Resolution 2020-15 - Real Estate
CHAIR JOHNSON stated that they have the Revised Investment Guideline, Resolution 2020-15 regarding real estate and asked for a motion on that. <u>MS. HARBO moved to adopt the Resolution.</u> <u>MR. WEST seconded the motion.</u>

MR. WEST asked that they review Section D, Prudent Leverage, on page 6. It still has language that says, "With the authorization by the ARMB, the Chief Investment Officer may place leverage on a pool." He said he thought that language was going to be eliminated.

MR. SIKES stated that language will remain but will need to come back to the Board to get approval.

MR. HANNA stated that he is in support of leverage, as MR. SIKES has proposed and that he has no trouble with the removal of the pool leverage sentence.

CHAIR JOHNSON asked what could go wrong by keeping at least the Chief Investment Officer approval process in place. He stated that there is a motion on the floor which takes into account the document presented prior to removal of that and asks if there is a motion to amend the previous motion.

MR. WEST moved to remove the last sentence in the first paragraph under "Prudent Leverage." MS. HARBO seconded the motion.

A roll call vote was taken, and Resolution 2020-15 as amended was adopted with one opposition (CHAIR JOHNSON), and with two trustees not present (MR. MOEN and COMMISSIONER TSHIBAKA).

ACTION: Revised Investment Guideline Resolution 2020-16 - Farmland
MR. SIKES stated that 2020-16 relates to revising the target crop rates from 60 percent row, 40 percent permanent to 80 percent row, 20 percent permanent. The plus or minus 10 percent bond will stay. He said a cleanup item is the removal of the reference at the bottom to the inflation index used to calculate the actual real rate of return. The sentence containing "CPI All Urban" is being removed as it is not relevant.

MS. HARBO moved 2020-16. MR. WEST seconded the motion.

A roll call vote was taken, and Resolution 2020-16 was adopted unanimously.

15. PERFORMANCE MEASUREMENT, 2ND QTR

MR. ERLENDSON explained the market overview regarding the capital markets in the broader economy. The initial report was that the U.S. GDP contracted by almost a third at the end of the first quarter and the COVID affect started to take off towards the end of February through March. It was adjusted slightly so that the second revision has GDP shrinking by 31.7 percent. 70 percent of GDP is consumer spending which during February through April, U.S. consumers quit spending and started saving money. The savings rate jumped from 9 percent to 13 percent and when the stimulus checks came out it jumped to almost 34 percent, the retail and hospitality sectors where hit the hardest. He said the inflation rate was less than 1 percent and the Federal Reserve has said that they have a target rate of 2 percent and with interest rates down the expectation is for longer-term returns. The International Monetary Fund projection that was established in April and updated in June, shows that expectations for economic growth have declined. In the Euro area it is down by about 10 percent negative growth for the entire calendar year. For the U.S. it's about negative 6-plus percent. Two of the largest emerging economies in the world, China and India are positive. The Gross government debt as a percent of GDP, the U.S. has been above 100 percent of GDP for about a year. The U.S. is at its highest amount of debt relative to the underlying economy since WWII. He said that Corporate America believes that whoever is sitting in the Oval Office is going to have to take a look at the raising business taxes to pay the extraordinary amounts of debt that have been issued by government. He said that the Federal Reserve, in an effort to keep investors interested, purchased Treasury bonds, government-backed mortgages, and went so far as to purchase investment-grade corporate bonds including Apple, Home Depot, and Microsoft. The balance sheet for the Federal Reserve is around $7 billion and they purchased about $7 billion of corporate securities. The bond market in the U.S. is

$10 trillion so although the activity is almost negligible, the impact of that agency of government getting involved in support of the corporate debt markets is notable. He said when there is more concentration in the market about what's doing well, as opposed to all parts of the economy doing well, it means that active managers are going to underperform and that the risks of being in that asset class are concentrated and are greater risk and less participation in the favored parts of the market. From a valuation perspective, the simple P/E calculation suggests that no matter where you go in the equity markets, the expected return going forward is lower. He said there is also an interesting phenomenon that not only is there concentration about opportunity and risk in the domestic economic sectors of our stock market, but when you look at opportunities outside the U.S., there's quite a range of outcomes that take place here. He stated that they are seeing equity valuations are relatively high, but the return on them is the best of the available asset classes. Fixed income yields have been declining. He urged caution in terms of having good managers that are as mindful of long- term risk as they are of short-term gain.

16. HEALTHCARE TRANSFORMATION STRATEGY

MR. HANNA introduced MR. GILLAM, CEO and CIO of McKinley Capital and also explained that McKinley Capital is an Alaska-based investment firm with a longstanding relationship with the ARMB that focuses on selecting equities in companies whose growth rates are accelerating above market expectations. In March of 2019, the ARMB incepted a thematic equity mandate with McKinley known as McKinley Global Healthcare Transformation which seeks to invest in innovative solutions focused on driving down healthcare costs.

MR. GILLAM stated that McKinley Capital is a global firm based in Anchorage with offices in Juneau, Abu Dhabi, Chicago, and New York. They use a data driven methodology and have a partnership with the university system for artificial intelligence and data science. MR. GILLAM'S father founded the business 30 years ago and it is still controlled and owned by the employees. He also said they acquired the McDowell Group earlier this year. MR. GILLAM went on to explain that they have created a search algorithm that identifies companies that are considered healthcare transformation. It does not matter what country or what sector they are defined in, if their business is levered towards better, faster, cheaper delivery of healthcare, then it counts. He said they have about 2,700 securities is this category and they go through the normal McKinley process of identifying companies that have the risk-adjusted return and acceleration we like. They perform qualitative reviews to ensure that they get positive earnings surprise.

MR. HIPPLER stated that McKinley's underweight to Japan seems consistent and asked if that was intentional.

MR. GILLAM stated that everything they do is bottom-up-driven, that not as much transformation is going on there. The strategy that they use was designed to go after those that have the highest amount of innovation and transformation and there is not a lot of that in Japan at the moment.

CHAIR JOHNSON asked with respect to the significant investment in China, what problems are they anticipating with respect to the trade war issues between China and the U.S.?

MR. GILLAM explained that all of the growth from China is coming from their population, so their companies are serving the Chinese population, the trade war is not going to impact the generation of earnings from those companies. He also stated that they do not own ADRs in any retirement plan, so that is a risk mitigator. He also mentioned that the U.S. dollar is weakening and has been substantially weakening in the last couple of months, maybe the last couple of quarters.

(CHAIR JOHNSON recessed the meeting at 4:45p.m.)

Friday, September 18, 2020

CALL BACK TO ORDER

CHAIR JOHNSON reconvened the meeting at 9:00 a.m. All Board members were present.

17. UPDATE ON THE U.S. POLITICAL LANDSCAPE

MR. HANNA introduced MR. MEHLMAN from KKR as the next presenter who will be speaking about the current political climate, upcoming elections and implications for investments.

MR. MEHLMAN started out by explaining that he wears two hats. He is head of global public affairs and public policy which allows him to look around the world to identify important geopolitical, public policy, and societal trends that will affect how they invest. He is also co-head of a global impact fund. They have invested half of their $1.3 billion with 10 investments in companies that are achieving private equity returns by investing in lower and lower-middle private equity companies, or companies with a private equity lens and private equity strategy. He said that a good macro bet would be one that is adapting and mitigating the impacts of climate change, so investing in companies that help with energy efficiency, that convert waste to energy, and reduce the amount of energy that a particular operator uses, that reimagines the supply chain of buildings, and that deal with the impact of extreme weather. He said another one is workforce development. The majority of our workforce is being displaced because of technology, even before COVID, and suggested figuring out hybrid ways to teach people throughout their lives, using a combination of online and coaching. He stated the third area of focus is how do you manage waste in a differentiated way? They essentially identified four or five very large macro trends and try to invest around it.

MR. MEHLMAN changed his focus to the upcoming elections and stated that in his opinion if the election was held today Vice-President Biden would win the election. The polls show he is up about 7.7 percent. The electoral college today favors Republicans over Democrats, this is due to President Trump, he has an affinity of winning the votes of non-college-educated white voters that are a plurality, if not a majority of the electorate in states like Michigan, Pennsylvania, Wisconsin, Minnesota and the upper Midwest. In order for Biden to win, he has to win the popular vote by about 4 percentage points, anything less and the same thing could happen to him as what happened to Secretary Clinton in 2016. He also said in history the economic performance of the election year and the prior year is the most important thing to a president's likelihood of getting reelected. However, people vote based on attributes, not issues. He said that the three things that matter most to voters is the economy, the attributes of the candidate, not issues, and vice-presidents usually lose. One other point he made was that establishment Democrats usually lose while insurgent Democrats usually win. He also stated that the stock market performance does not indicate who is going to win or lose, they are not correlated. MR. MEHLMAN encouraged the Board to pay attention to who does not vote. He said that for years people said that if everyone voted, the Democrats would always win elections, however in the electoral college that's not true because in the states of Michigan, Minnesota, New Hampshire, Pennsylvania, Wisconsin eligible citizens who did not vote were among non-college-educated citizens. So demographically the non-voters looked more like the Trump voters than the non-voters look like Biden voters. He stated that there is a real chance that the announcement of the winner of the election will be delayed due to approximately 50 percent of the country voting by mail in ballots due to the pandemic.

MR. MEHLMAN said in some ways, the Senate matters more than the White House in terms of policy changes we are going to see and encouraged the Board to pay attention to that. COMMISSIONER MAHONEY asked what MR. MEHLMAN'S outlook for the Senate was.

MR. MEHLMAN stated that he thought it was going to be really close, that most of the competitive elections for the Senate are in Republican states. As of now, there are 46 Democrat seats that are safe and 46 Republican seats that are safe and eight toss- ups. He stated according to the polling, Republicans, as of today, are holding six of those eight.

CHAIR JOHNSON asked what entities such as KKR are doing by way of hedging or considering those circumstances.

MR. MEHLMAN stated that they are systematically looking by industry and by business unit at what is the likely outcome potentially of a Democrat sweep -- keeping the house, winning the Senate, and winning the White House. Under the Biden administration and a Democratic Senate there would be more antitrust enforcement -- Obama-era rules around climate change that were not put in place such as the Clear Skies rule. There would be enforcement of leverage lending limits, tax increases, capital gains differential to be eliminated, an attempt to pass an Affordable Care Act, and a change in prescription drug prices in that environment. The biggest differences in rules would be seen in taxes, energy, and labor rules. There would likely be a large infrastructure bill and the definition of "infrastructure" will be broadly defined. He said they are currently working with their global macro team to study previous periods when uncertainty existed to determine what it means. He said they developed three models. The first model would be what happened on election night; the second model is they will not know what happened on election night but know by the middle of November and; third would be what is each of the two likely to mean around market impact and how companies behave to prepare for that.

MR. HANNA asked from a pure investment perspective, how they think about the kind of headline risk of making China investments, when on their merits are very attractive investments, and how would KKR potentially think about that if they were in our seats running a public fund?

MR. MEHLMAN stated that they had a different idea about China than many people have had in the United States. They look at areas that are less controversial, like food safety or environmental services. He said that state funds will be under more scrutiny from all stakeholders, that legislators and Congress will look at where American pension funds, state funds, are investing in China and pay a lot more attention to it. That any company that supports the Chinese surveillance state is going to be an area to watch.

MR. WILLIAMS asked depending on how the election goes, how much difference is there in China policy, whether it is a Biden administration or a Trump administration?

MR. MEHLMAN stated that he thinks there will be less noise in a Biden administration. During the Obama administration there was a skeptical view of Chinese foreign direct investment through CFIUS, so as a general rule, we are in a period of rivalry regardless of who is in office.

MR. WILLIAMS asked if MR. MEHLMAN sees cases where there would be more opportunity and less risk, or does he see it pretty much the same and it probably will continue no matter what?

MR. MEHLMAN said he thought it would continue.

MR. HIPPLER asked if MR. MEHLMAN sees long-term inflation risks, and do those risks change with the outcome of the election?

MR. MAHLMAN said that he did not think the outcome of the election affects that.

MR. ERLENDSON asked if MR. MEHLMAN was looking at deploying additional capital outside of the U.S. - would he be more concerned about the currency effect, or less?

MR. MEHLMAN stated that he thought that it is definitely worth looking at whether to hedge that in how to structure an investment, and how to anticipate what could happen.

MS. HARBO asked about the impact of the pandemic on New York City and the office building space and the tourism?

MR. MEHLMAN stated that the impacts are good and bad. New York did a really good job keeping the infection rate down to 1 percent for more than a month. However, the office occupancy and building occupancy is very low which is a real problem for commercial real estate and hotels.

MR. WILLIAMS asked how MR. MEHLMAN felt about how the markets have come down overall in terms of adjusting to all the risks?

MR. MEHLMAN stated that he thinks the market is most interested in monetary policy -- the distinction between the big tech companies and everybody else.

18. STATE STREET GLOBAL ADVISORS MANDATES UPDATE

MR. HANNA introduced MS. PARK and MS. APPERSON from State Street Global to update the Board on the status of the money market fund and several passive equity mandates totaling $3.7 billion for both the DB and the DC Plans they manage.

MS. PARK stated that she manages the SSGA State of Alaska relationship for SSGA and that MS. APPERSON is the equity index investment strategist. She said that they manage roughly $1.1 billion for the Defined Contribution Plans and for the Defined Benefit Plan they manage about $2.5 billion. She pointed out that on page 4, the Defined Contribution side, the S&P 500, the Russell 3000, as well as a global equity ex-U.S., which would be the MSCI ACWI ex-U.S. index ended in $1.1 billion for fiscal year-end. As far as MSCI Word ex U.S., and State Street MSCI Emerging Markets index, yearend was $2.5 billion. Page six shows the performance differentials which MS. APPERSON will discuss later in more detail. She said the global equity ex-U.S. index is the third portfolio managed for the DC Plan. She said the reason for such a large difference in the index is because of the way dividends are taxed. The index uses a very high and the most onerous tax rate, where the portfolio is, as a U.S. investor, the Board is not subject to that, so the majority of this outperformance is due to this tax treatment differential. She said one of the benefits of working with a large asset manager is the sheer volume of trading that they do, is that they are able to often transact at zero transaction costs. She said from 2012 to June of 2020 the ARMB has experienced an estimated cost savings of about $7.4 million which translates into about 16 basis points. She stated that the second component in savings comes from their ability to do a securities cross. She explained that if the portfolio wants to buy Apple, but another portfolio wants to sell Apple, they could cross that transaction which is a benefit by being invested in commingled funds.

MS. APPERSON pointed the Board's attention to Slide 6 which includes the performance of the Alaska DC Plans investments in which she referenced the fund total growth performance relative for each index for the last 12 months. The Russell 3000 Index Fund is covering all U.S. securities which had a performance of 6.46 percent. This fund had some modest underperformance, but it is in line with long-term performance. The S&P 500 Fund also underperformed by 2 basis points. Slide 7 shows the return of the global equity ex-U.S. strategy which is also within the Defined Contribution Plans. It is essentially all international markets as defined by MSCI and focuses on large and mid - cap stocks. The fund has outperformed by 45 basis points during the last 12 months. She stated that the fund will have a positive contribution in performance and that is largely driven by dividend withholding taxes. U.S. based investors are able to reclaim a portion of taxes and that was about 34 basis points of that 45 basis points. She said another thing common with DC funds is that they can also experience fair value pricing, so when there are more volatile markets, funds can be fair-valued and that protects investors. So, in addition to the dividends withholding tax reclaims there is impact from fair value pricing.

MR. ERLENDSON asked if MS. APPERSON has any perspective on the utility of an organization like ARMB using a third party as opposed to a custodian as a tax reclaim agent?

MS. APPERSON stated that the ARMB would not have to use a third party as they handle all of that for them because they are invested in pooled funds.

MS. PARK added that typically clients still use their custodian for separately managed accounts to do the reclaims on their behalf.

MS. APPERSON pointed the Boards attention to Slide 8 - World ex-U.S. IMI fund which is all developed markets with the exception of the U.S., but includes large, mid cap and small cap stocks.

The performance was negative 5.14 percent versus the index, which was negative 5.11 percent, so an underperformance of 3 basis points which is primarily fees as well as 1 basis point in security misweights, and in line with what they've seen in the past. The next slide showed emerging markets non-lending strategy with a performance of 3.35 percent for the funds and the index of 3.39. The outperformance within this strategy of about 4 basis points is largely attributed to trading strategies utilized around the index reconstitution as well as the rebalances. There was also income from an India cap gain. MS. APPERSON went on to explain the team shown in the Slides 11 and 12. She said that Slide 13 gives an overview of the AUM which ended the quarter at about $1.8 trillion in assets.

MS. PARK interjected by saying that the total SSGA ending the second quarter was at a little over $3 trillion, two-thirds was from the equity index business.

MS. APPERSON said Slide 15 shows their investment process. She stated that the funds are reviewed daily and the portfolio managers may have to actually make a change to a portfolio even if there are no flows into every fund. Once they do that, they look at the risk/return of the portfolio relative to its index and then make that decision. If they are investing cash or satisfying a redemption, they might utilize futures or look at the internal crossing capabilities. Finally, senior management will look at the entire set of portfolios on a global basis, discuss some of those deviations, and make a plan of action in order to adjust the process or adjust the bands if needed. MS. APPERSON then asked if there were any questions.

CHAIR JOHNSON asked as well. As there were none, he told MS. APPERSON to continue.

MS. APPERSON reminded the Board that the MSCI typically has four rebalances with the November and May rebalances being the most significant because that's when there are actual adds and deletes within the index. She said that the turnover doubled, there was about 90,000 different trades compared to the November rebalance from the prior year was about 30,000 trades. She also mentioned that they were initially going to add Kuwait into emerging markets but with the COVID environment and government closures, they will make that change in November. She went on to say that they do not invest in stocks outside the index but might have things like an ADR or rights to warrants that come up as an actual holding but are not out of benchmark exposure. The S&P fund is very much in line with the index in terms of security misweights as well as the sector. They are holding about 4,000 names relative to the index, which is close to 3,500, despite removing almost 500 names of the index so the portfolio looks pretty much like the index. The emerging markets portfolio is holding a larger number of stocks so despite the fact that there were not any material changes to the index methodology within the Russell suite, this year's was pretty tremendous in terms of rebalance activity.

PERFORMANCE MEASUREMENT - 2ND QUARTER CONTINUED

CHAIR JOHNSON invited MR. ERLENDSON and MR. CENTER of Callan to complete their report.

MR. CENTER stated as a reminder to the Board that standard deviation is a measure of overall volatility of the plans and that it is better to rank lower on the standard deviation chart. The Sharpe Ratio is a measure of a return per unit of risk, or how well risk is being implemented within the plan to improve performance. He stated that the defined benefit plans over the long periods of time have done fairly well relative to the benchmark on a risk-adjusted basis, that over the last year the Defined Benefit Plans have trailed their policy targets. He said that the healthcare plans long-term performance has held up very well relative to the benchmarks and the military plan has historically had a different asset allocation than the other pension plans - it also has its own policy target. The military plan has trailed its benchmark just slightly on a risk-adjusted basis over the long term.

MR. CENTER stated that the performance that they are seeing for the Defined Benefit Plans only reflects about 30 percent of the private equity performance because in Alaska plans do not present lagged performance and instead present actual performance through June 30th. He said about 70 percent of the private equity portfolio has yet to report their actual performance, so there is some missing data in the private portfolio and the private equity portfolio in particular. All of the domestic equity, international equity, and fixed equity portfolio - only 30 percent of those net asset values have been reported as of the data seen today. He stated that PERS, as of June 30th, was slightly overweight to domestic equity and global equity. There was a drastic rebound in the equity markets that resulted in a slight overweight to domestic equity as of quarter end, slightly underweight to the opportunistic asset classes and fixed income, and very minor overweight to real assets and private equity, but overall they were very close to targets. He also pointed out that the asset allocation of the Alaska retirement plans compare to other public funds, particularly, the domestic equity and domestic fixed income asset allocations are very similar to other public funds, but PERS is slightly overweight to real assets and other alternatives relative to other public funds. Overall, the PERS plan is slightly ahead of its target.

MR. CENTER said the PERS plan and TRS plan underperformed the target for the last quarter and the last one year, but has marginally outperformed over the three-year period. He pointed to some of the drivers of the performance including the shift of the domestic equity portfolio to be a blend of passive and factor-based investing or “smart beta”, growth in the large cap space, and a slight benchmark mismatch.

MR. WILLIAMS asked how long the Board has to wait before they know exactly where they sit. He also asked MR. CENTER to talk about the bullet regarding current quarter underperformance that was driven by the manager effect within private equity.

MR. CENTER explained that there is no perfect private equity proxy to compare this program against, and historically is has been compared against a blended group of public equity benchmarks. He said currently the ARMB is reporting on their performance “in real time”, and the problem with that is much of the private equity performance takes approximately 90 to 120 days to actually report their performance, so a good portion of the private equity portfolio has not yet reported their performance as of June 30. He also said that they prefer to use comparisons over longer time periods rather than short time periods. Over the last year, the private equity program is positive.

MR. HANNA said that one issue is whether to lag the private equity returns or not and there is no lagging at this time, but he noted that they are moving back to lagging them with the June quarter because it makes returns more comparable to the peer set which does lag the private equity returns. With respect to what benchmark used for private equity, it is tricky. He said that over the long term they have adopted a public fund proxy of third/third/third construct. Over the shorter term, on a one-quarter basis, that number is noisy and his own personal point of view is that they spend a lot of time at the Board level discussing that specific issue, and it is not really a relevant comparison on the short-term and doesn't deserve a lot of consideration and discussion.

MR. RYERSON stated that MR. HANNA covered the comparison issue very well.

MR. WILLIAMS said as a Trustee, he sees the bullet that says "underperformance was driven by the manager effect" as a red flag but what he's hearing is that the bullet should have said "The benchmarks for private equity are a little clumsy and aren't perfect, and when you're looking at first-quarter results they're really noisy."

MR. CENTER stated that he agrees with MR. WILLIAMS, but he does not think that the reason the plan is underperforming the benchmark over a single quarter should ever be the reason for believing that a manager is bad, as a singly quarter is a very short window to be making a decision. He agreed the bullet should have been a little clearer to that point.

MR. HANNA said they do an annual review of private equity that will occur at the next meeting in December where they will sync up the returns for various time periods. For the December report they will be comparing the ARMB's private equity performance through June to the Cambridge Private Equity Benchmark and to the public market equivalent to show either premium or deficit in terms of comparison to other actively managed private equity portfolios.

MR. CENTER stated that the five, seven, and 10-year performance of PERS and TRS is at or above the target median, and the long-term period, which is just under 29 years, is ahead of the benchmark by about 7 basis points. As far as domestic equity performance it has trailed the Russell 3000 which is its target benchmark and has trailed it by about 4 percent, the large cap portfolio trails by about 3 percent, and the small cap portfolio by about 5 percent. He reminded the Board that the U.S. large cap equity program is a blend of the S&P 900, passive investment in the S&P 900, and smart beta programs managed against Scientific Beta provided factor benchmarks. He proposed that when they begin the process of going through the asset allocation study in December, they do what Callan calls an equity structure analysis where they look at the overall equity program and either reconfirm the allocation to factor-based portfolios or make the decision to move from factor-based portfolios back towards more traditional cap-weighted benchmarks.

MR. HANNA commented that this year has been particularly difficult for factors, both small and value specifically, and quality as well. That he thinks that it is always important to re-underwrite these things and to have eyes wide open in terms of structural changes in the market.

MR. WILLIAMS agreed that this year has been very unusual, and some things make sense and some things do not. He stated that he likes the idea of sticking with a strategy for a length of time and being consistent.

MR. CENTER stated that he does not think that Callan is going to recommend drastic changes to the equity program, but it is important that the Board understands the existing structure and why that near-term performance has occurred. He said that the Global equity program has done fairly well relative to its target over the last year and is ahead of the benchmark by about 1.5 percent, five years ahead by half a percent and about 70 basis points over the last 10 years - overall it has done fairly well. He stated that Arrowstreet and Cap Guardian, which are two core managers, are both doing very well in relationship to the benchmark. Baillie Gifford and Brandes are both complementing each other very well as they both have divergent performance where Baillie Gifford on the growth side, is outperforming the growth benchmark, and Brandes on the value side, is outperforming the value benchmark. This portfolio is also 40 percent passive with an allocation to the State Street World ex-U.S. CIT and has about a 15 percent allocation to the Legal & General Scientific Beta program as well. He also pointed out that the fixed income for the retirement plan includes internally managed aggregate portfolio which is about 70 percent of the fixed income program, along with some portfolios managed by Fidelity and some alternative fixed income portfolios primarily managed by Crestline. The Alaska U.S. Aggregate portfolio returned 3.5 percent over the last quarter and is about 60 basis points ahead of the Bloomberg Aggregate. The opportunistic fixed income portfolio was also up about 6.7 percent. The opportunistic portfolio includes the tactical asset allocation strategies managed by PineBridge and Fidelity and is about 60 percent of the opportunistic portfolio. The DC Plan shows that about 60 percent of participants are invested in the target date funds with the remainder split between the passive and active investment options. The TRS DC Plan has about 60 percent invested in the target date funds, about $18 million flowed into the plan during the second quarter. The Deferred compensation Plan has only about 20 percent participants invested in the asset allocation funds, with the remainder split amongst the various active and passive investment options. The Deferred Comp Plan is slightly cash flow negative where about $2 million flowed out of the plan on a net basis during the quarter. The SBS Fund has about 60 percent invested in the target date funds and is slightly cash flow negative where about $3 million flowed out of the fund during the quarter.

MR. CENTER moved on to discuss the money market options within the DC Plans. He said the BlackRock Strategic Completion Fund is the new multi-strategy inflation-focused investment option which returned about 7 percent during the quarter, but has performed in line with its custom benchmark. The Stable Value Fund continues to be a top decile performer, the International Equity Fund, which is a multi-manager white label fund with Baillie Gifford and Brandes, has performed very well over the last three years. And the Northern Trust ESG Fund, a new passive ESG option, is also performing in line with its benchmark over time. The only real active U.S. equity option is the T. Rowe Price small cap fund which has performed above median over the long term.

MR. WILLIAMS asked if all of the passives are 100 percent pure passive, or is there things where it is mostly passive, but with a little bit of a tilt on it - either passive or active?

MR. CENTER said that everything here is passive. For some benchmarks the only way an index provider is able to offer something that is similar is by using stratified sampling. They created a system to mimic the performance of the benchmark by buying securities as close to the benchmark as possible in a cost effective manner.

MR. HIPPLER asked if other funds examining and lowering their targets for what fixed income can generate going forward because interest rates have come down so far and have given robust returns on fixed income as interest rates have fallen?

MR. CENTER stated that when they perform the next asset allocation study in early 2021, they will be using Callan's new capital market expectations. He said they revise their capital market expectations every year and because of the movement seen in interest rates, there will be a lower expected return for fixed income over the next 10 years embedded into Callan's capital market expectations. He stated that they are definitely lowering their expected return of traditional fixed income in the new capital market expectations.

MR. ERLENDSON referred to the BEER Ratio and commented that with interest rates being so low that people are looking for ways to enhance the yield that they achieve from their fixed income portfolios.

CHAIR JOHNSON asked if there any final comments, questions for MR. ERLENDSON and MR. CENTER before moving on. As there were none, CHAIR JOHNSON suggested to MR. HANNA that they take the investment actions requiring votes first and then deal with the ARMB delegations to staff as a report afterwards.

MR. HANNA stated that one of the actions is the actual delegation to staff and the brokerage option is going to be a DRB action item.

1. INVESTMENT ACTIONS/INFORMATION ITEMS

MR. PUCKETT said that the criteria that Treasury and DRB used in investigating the different options that were available were cost effective compared with other possible platforms, smooth integration with the participants' accounts and investments, participant ease to utilize and discontinue, and also robust research and information resources. The recommendation is that the ARMB direct staff to work with Empower Retirement in implementing a brokerage platform to members of the Alaska Supplemental Annuity Plan, the Defined Contribution Retirement Plans, and the Deferred Compensation Plan.

CHAIR JOHNSON asked MR. WILLIAMS if he was making a motion to take this action on behalf of the committee. MR. WILLIAMS moved that the ARMB work with Empower Retirement in implementing a brokerage platform to members of the Alaska Supplemental Annuity Plan, the Defined Contribution Retirement Plans, and the Deferred Compensation Plan. CHAIR JOHNSON stated that no second is necessary because it has been forwarded by a committee.

A roll call vote was taken, and <u>the resolution was adopted unanimously.</u>

MR. HANNA then proceeded with the action item relating to the change in the Stable Value Fund. He stated that he believed that the Board should hear directly from the in-house expert MS. PREBULA.

MS PREBULA stated that the DC Committee approved the recommendation that the staff recommends the ARMB to direct staff to modify the existing contract for the Stable Value Fund to reflect authorization to invest cash reserves in the T. Row Price Cash Reserves Trust.

CHAIR JOHNSON asked MR. WILLIAMS to confirm that the motion is being made by the DC Committee.

MR. WILLIAMS stated that the motion that was unanimously approved by the DC Committee is being brought before the Board.

CHAIR JOHNSON stated that the motion is before the Trustees and no second is necessary because it has been forwarded by the DC Committee.

A roll call vote was taken, and the resolution was adopted unanimously.

2. ARMB DELEGATIONS TO STAFF

CHAIR JOHNSON asked MR. HANNA if he would like to go forward with any other investment actions on the specific delegation to him as CIO and have a broader discussion about that.

MR. HANNA agreed and stated that the staff recommendation is a continuation of the same delegated responsibilities which also included ratification of CHAIR JOHNSON'S interim delegation to him as acting CIO. He said that the only actions he took for the ARMB were to transfer roughly $1 million of redemption proceeds from five accounts in the stages of closure as well as to ratify the set of sub-delegations that CIO MITCHELL had in place. He stated that the full recommendation is that the ARMB adopt Resolution 2020-17, delegating certain responsibilities to the Chief Investment Officer and further execute the Second Addendum to Resolution 2017-05 from September 12, 2020 through the effective date of Resolution 2020-17.

CHAIR WEST moved 2020-17. MS. HARBO seconded the motion.

A roll call vote was taken, and Resolution 2020-17 was adopted unanimously.

MR. HANNA began his summary of the various forms of delegation that have been passed on to CIO and staff. He said that most are related to governance, asset allocation, manager selection, and weighting. MR. HANNA further explained that most of the resolution just passed deals with delegating authority to conduct the basic investment business of the Board allowing the CIO to contract, open accounts, execute, and settle transactions. Lastly the resolution allows the CIO to let managers name the ARMB as a client and to further subdelegate portions of these responsibilities to other investment officers. MR. HANNA went on to explain that there is a specific rebalancing policy in Resolution 2012-17 which is to review the asset allocation at least monthly. The next portion is the one that allows the CIO to adjust asset class weights and manager weights within the ARMB approved bands. He said that there is a requirement that the CIO must inform the ARMB of any asset allocation changes and any exercise of the authority from the CIO. The CIO may further delegate these responsibilities when the CIO is out of the office and someone else is in his stead. He said the last set of delegations that the Board makes are delegated authority to make investments contained within the asset class policies for all the alternatives such as private equity, real estate, farmland, timberland, and infrastructure and the CIO may invest up to $100 million per investment subject to due diligence.

MR. WILLIAMS asked what constitutes a prior notification?

MR. HANNA said that he would like to allow 5 days to get a response from the ARMB Chair, but it isn't practical in some cases. CHAIR JOHNSON suggested he and MR. HANNA work up a protocol on that.

MR. HANNA hit on the subject of fixed income and its place on the Board's asset allocation. He said he expects it to be a major source of discussion for the next year. He said Fixed income has served three roles historically. First to provide liquidity for the system, especially in crisis. The other two roles are a source of yield, which has been historically a good source of yield, and a source of real diversification to the portfolio in an equity crisis. He said that it is really those last two pieces where it really is called into question now with rates as low as they are.

UNFINISHED BUSINESS

None.

NEW BUSINESS

None.

OTHER MATTERS TO PROPERLY COME BEFORE THE BOARD

None.

PUBLIC/MEMBER COMMENTS

None.

INVESTMENT ADVISORY COUNCIL COMMENTS

DR. MITCHELL shared thoughts on the Brandes presentation, "Is Value Dead?" He thought the content of the presentation was excellent and their approach quite different. He also discussed the bull market versus the bear market, noting that bull markets last longer, and the returns on a bull market are far greater than the declines in a bear market, but bear markets are normal, and the Board should prepare for bear markets.

DR. JENNINGS commented on the discussion regarding leverage. He said that the theory in academic finance is that if one can borrow and lend at the same rate, than one is actually able to enhance portfolio risk/reward tradeoffs by moving beyond the blue line of efficient frontier and leverage up or down a portfolio that has a higher risk/reward tradeoff. He stated that at their Education Conference in New York the Chief Investment Officer of Mann Investments discussed how a hedge fund person would build a public pension portfolio, his solution was to lever up and lever down various factors. He said the action the Board took yesterday regarding real estate portfolio is a step in the right direction of exploring ways that leverage can enhance the overall portfolio risk/reward tradeoff.

MS. RYERSON complimented Sagitec whom she was familiar with from when she was with Colorado Fire and Police which had a very complicated plan. She stated that going forward the system will work well, and it will no longer become an issue every 10 years needing to find a new pension administration system. She also complimented the DC Committee for moving slowly on the brokerage window.

TRUSTEE COMMENTS

MS. HARBO congratulated MR. HANNA on his appointment as CIO and wished the best of luck to MS. ALEXANDER in her new teaching endeavor.

MR. WILLIAMS stated that he appreciated the Brandes presentation on "Is Value Dead?" He thought it was refreshing and thoughtful. He said that he had a lot of concerns about COVID and its impact financially, but the strategies used make sense to him. He said that he is interested in leverage and that it is something that he is warming up to. He too wished MS. ALEXANDER well.

MR. MOEN appreciated the welcome and stated that in light of COVID he would be happy to text a photo of a fresh King salmon dinner with fresh Dungeness crab on it to all the Board members.

FUTURE AGENDA ITEMS

MR. HIPPLER stated that he thinks the CIO is planning on addressing fixed income and that he thinks the Board could use even more discussion on leverage.

ADJOURNMENT

There being no objection and no further business to come before the board, the meeting was adjourned at 12:00 p.m. on September 18, 2020, on a motion made by MR. WEST and seconded by MS. HARBO.

Chair of the Board of Trustees
Alaska Retirement Management Board

ATTEST:

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Corporate Secretary

Note: An outside contractor recorded the meeting and prepared the summary minutes. For in-depth discussion and more presentation details, please refer to the recording of the meeting and presentation materials on file at the ARMB office.

ALASKA RETIREMENT MANAGEMENT BOARD
STAFF REPORT
Division of Retirement & Benefits Report
December 3, 2020

Summary of Monthly Billings / Buck Global LLC

Attached for your information are the quarterly payments related to actuarial services provided by the Division's consulting actuary, Buck Global LLC

Items listed represent regular and non-regular costs incurred under our current contract.

The listed costs are charged to the System or Plan noted on the column headings.

Summary through the three months ended September 30, 2020

New for this quarter is the GASB 67/74 reports, GASB 68/75 reports, and the salary floor discussion.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Summary of Monthly Billings - Buck Global LLC	ACTION:	
DATE:	December 3, 2020	INFORMATION:	X

BACKGROUND:

AS 37.10.220(a)(8) prescribes that the Alaska Retirement Management Board (Board) “coordinate with the retirement system administrator to have an annual actuarial valuation of each retirement system prepared to determine system assets, accrued liabilities, and funding ratios….”

As part of the oversight process, the Board has requested that the Division of Retirement & Benefits provide quarterly summary updates to review billings and services provided for actuarial valuations and other systems’ request.

STATUS:

Attached are the summary totals for the three months ended September 30, 2020.

Buck
Billing Summary
For the Three Months Ended September 30, 2020

	PERS	TRS	JRS	NGNMRS	EPORS	AHF	RHF	SBS	DCP	TOTAL
Actuarial valuations	$ 54,560	43,653	5,457	5,455	-	-	-	-	-	$ 109,125
KPMG audit information request	1,245	498	10	35	-	-	-	-	-	1,788
ARMB presentations and meeting attendance	3,411	3,414	-	-	-	-	-	-	-	6,825
FY20 final PERS/TRS contribution rates	3,411	3,414	-	-	-	-	-	-	-	6,825
GASB 67/74	7,572	6,060	759	759	-	-	-	-	-	15,150
GASB 68/75	22,722	18,180	2,274	2,274	-	-	-	-	-	45,450
Salary floor discussion	1,375	-	-	-	-	-	-	-	-	1,375
Projections	6,750	6,750	-	-	-	-	-	-	-	13,500
TOTAL	$ 101,046	81,969	8,500	8,523	-	-	-	-	-	$ 200,038
For the Three Months Ended September 30, 2019	$ 147,695	107,666	17,109	15,503	-	-	8,799	-	-	$ 296,772

ALASKA RETIREMENT MANAGEMENT BOARD

STAFF REPORT

Division of Retirement & Benefits Report
December 3, 2020

Retirement System Membership Activity as of September 30, 2020

Attached for your information are the membership statistics for the quarter ending

- September 30, 2020

We see a net increase in active members from last quarter, all in DCR members:

- PERS Tier 1-3 active members decreased from 11,162 to 10,963 or a decrease of 199.
- PERS DCR active members increased from 23,378 to 23,755 or an increase of 377.
- PERS active members had a net increase of 178.

- TRS Tier 1-2 active members decreased from 3,812 to 3,808 or a decrease of 4.
- TRS DCR active members increased from 5,569 to 6,051 or an increase of 482.
- TRS active members had a net increase of 478.

Retiree counts have changed in the following manner:

- PERS retirees increased from 36,269 to 36,466 or an increase of 197 (all tiers).
- TRS retirees increased from 13,089 to 13,340 or an increase of 251 (all tiers).

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Retirement System Membership Activity as of September 30, 2020

ACTION: ______

DATE: December 3, 2020

INFORMATION: X

BACKGROUND:

Information related to PERS, TRS, JRS, NGNMRS, SBS, and DCP membership activity as requested by the Board.

STATUS:

Membership information as of September 30, 2020.

MEMBERSHIP STATISTICS AS OF JUNE 30, 2020

	PERS						TRS					JRS	NGNMRS	SBS	DCP
	DB				DCR	SYSTEM	DB			DCR	SYSTEM				
	Tier I	Tier II	Tier III	Total	Tier IV	TOTAL	Tier I	Tier II	Total	Tier III	TOTAL				
Active Members	823	2,626	7,713	11,162	23,378	34,540	200	3,612	3,812	5,569	9,381	72	n/a	20,357	6,349
Terminated Members															
Entitled to Future Benefits	279	1,798	3,193	7,208	1,717	6,987	48	726	774	782	1,556	2	n/a	27,517	5,591
Other Terminated Members	1,030	2,057	7,488	10,575	14,643	25,218	240	1,505	1,745	2,757	4,502	1	n/a	n/a	n/a
Total Terminated Members	1,309	3,855	10,681	15,845	16,360	32,205	288	2,231	2,519	3,539	6,058	3	n/a	27,517	5,591
Retirees & Beneficiaries	22,675	8,759	4,706	36,140	129	36,269	10,098	2,955	13,053	36	13,089	143	711	n/a	n/a
Managed Accounts	n/a	n/a	n/a	n/a	5,860	5,860	n/a	n/a	n/a	1,523	1,523	n/a	n/a	2,729	2,558
Retirements - 4th QTR FY19	69	160	128	357	3	360	2	16	18	2	20	2	6	n/a	n/a
Full Disbursements - 4th QTR FY19	10	64	68	142	320	462	-	9	9	55	64	-	n/a	383	121
Partial Disbursements - 4th QTR FY19	n/a	n/a	n/a	n/a	64	64	n/a	n/a	n/a	10	10	n/a	n/a	1,460	593

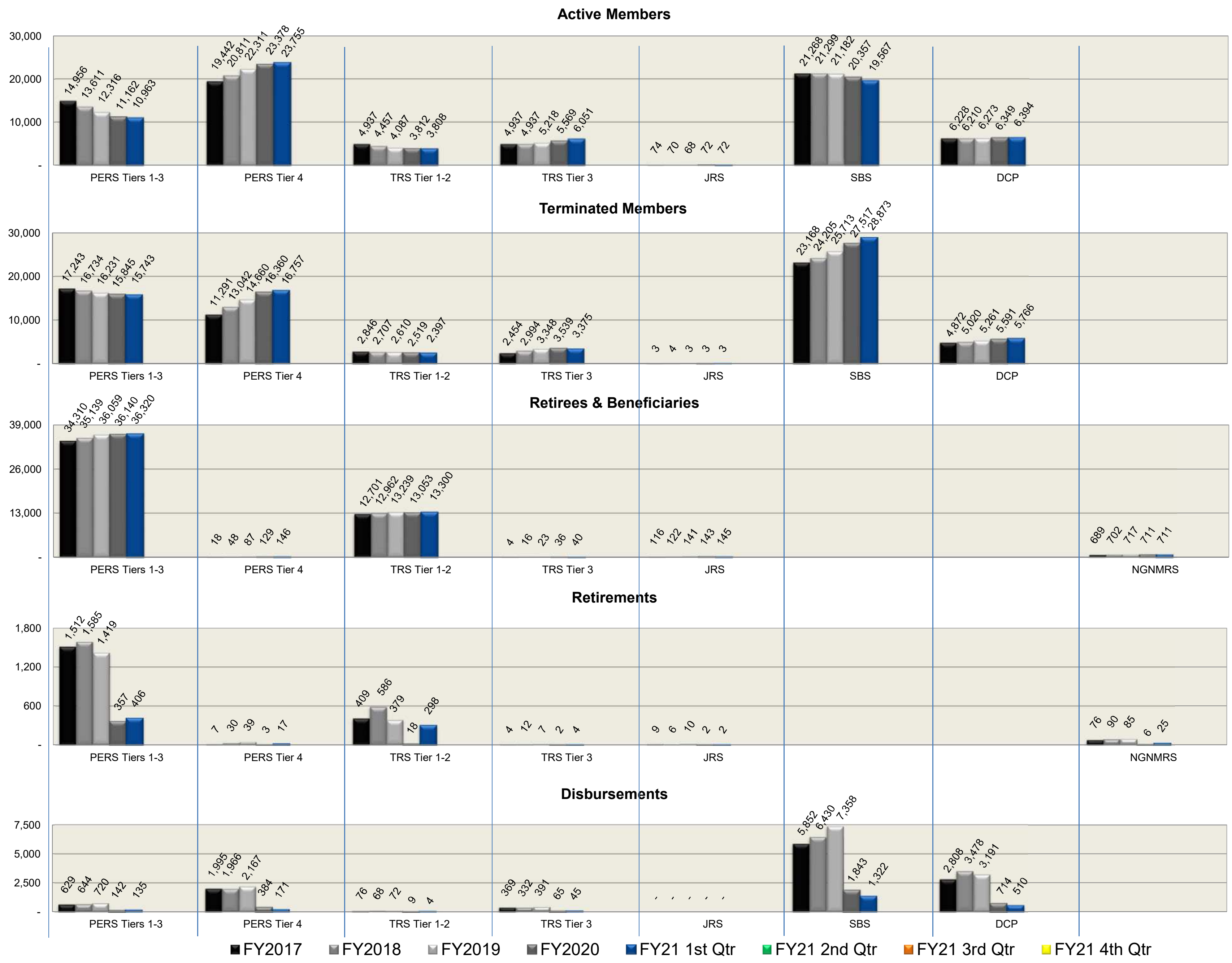
MEMBERSHIP STATISTICS AS OF SEPTEMBER 30, 2020

	PERS						TRS					JRS	NGNMRS	SBS	DCP
	DB				DCR	SYSTEM	DB			DCR	SYSTEM				
	Tier I	Tier II	Tier III	Total	Tier IV	TOTAL	Tier I	Tier II	Total	Tier III	TOTAL				
Active Members	795	2,550	7,618	10,963	23,755	34,718	199	3,609	3,808	6,051	9,859	72	n/a	19,567	6,394
Terminated Members															
Entitled to Future Benefits	268	1,767	3,166	5,201	1,788	6,989	26	638	664	726	1,390	2	n/a	28,873	5,766
Other Terminated Members	1,019	2,054	7,469	10,542	14,969	25,511	237	1,496	1,733	2,649	4,382	1	n/a	n/a	n/a
Total Terminated Members	1,287	3,821	10,635	15,743	16,757	32,500	263	2,134	2,397	3,375	5,772	3	n/a	28,873	5,766
Retirees & Beneficiaries	22,623	8,862	4,835	36,320	146	36,466	10,111	3,189	13,300	40	13,340	145	711	n/a	n/a
Managed Accounts	n/a	n/a	n/a	n/a	5,878	5,878	n/a	n/a	n/a	1,508	1,508	n/a	n/a	2,870	2,731
Retirements - 1st QTR FY20	68	167	171	406	17	423	61	237	298	4	302	2	25	n/a	n/a
Full Disbursements - 1st QTR FY20	9	47	79	135	138	273	2	2	4	33	37	-	n/a	123	45
Partial Disbursements - 1st QTR FY20	n/a	n/a	n/a	n/a	33	33	n/a	n/a	n/a	12	12	n/a	n/a	1,199	465

Alaska Division of Retirement and Benefits

FY 2021 QUARTERLY REPORT OF MEMBERSHIP STATISTICS

Annual & Quarterly Trends as of September 30, 2020



LEGEND

Active Members - All active members at the time of the data pull,
except SBS & DCP, which are counts of contributors during the final quarter of each period.
Terminated Members - All members who have terminated without refunding their account,
except SBS & DCP, which are counts of members with balances at the end of the period less active members.
Retirees & Beneficiaries - All members who have retired from the plans, including beneficiaries eligible for benefits.
Managed Accounts - Individuals who have elected to participate in the managed accounts option with Empower.
Retirements - The number of retirement applications processed.
Full Disbursements - All types of disbursements that leave the member balance at zero.
Partial Disbursements - All types of disbursements that leave the member balance above zero. If more than one partial disbursement is completed during the quarter for a member, they are counted only once for statistical purposes.

ALASKA RETIREMENT MANAGEMENT BOARD

STAFF REPORT

Division of Retirement & Benefits Report
December 3, 2020

FY 2022 Health Reimbursement Arrangement employer contribution amounts –

Attached for your information is the memorandum establishing the FY 2022 Health Reimbursement Arrangement (HRA) employer contribution amount as determined by Alaska Statute 39.30.370.

Also attached is a summary spreadsheet for Fiscal Years 2008 - 2022.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Fiscal Year 2022 Health Reimbursement Arrangement amounts for employers

ACTION: ________

DATE: December 3, 2020

INFORMATION: X

BACKGROUND:

AS 39.30.350 “Employer Contribution Fund” states that Teachers’ and Public Employees’ Retiree health reimbursement arrangement plan trust fund is an employer contribution fund. Employee contributions are not permitted.

AS 39.30.360 “Management and Investment of the Fund” states that “The Alaska Retirement Management Board is the fiduciary of the fund and has the same powers and duties under this section in regard to the fund as are provided under AS 37.10.220.”

AS 39.30.370 “Contributions by Employers” states that “For each member of the plan, an employer shall contribute to the teachers’ and public employees’ retiree health reimbursement arrangement plan trust fund an amount equal to three percent of the average annual compensation of all employees of all employers in the TRS and PERS.” The Division of Retirement & Benefits calculates the HRA amount annually and reports this to all affected employers for proper payroll reporting each fiscal year.

STATUS:

Attached is the memorandum from the Division of Retirement & Benefits for Fiscal Year 2022’s Health Reimbursement Arrangement employer contribution per pay period.

Also attached is a summary spreadsheet for fiscal years 2008 - 2022.

MEMORANDUM

STATE OF ALASKA
DEPARTMENT OF ADMINISTRATION
Division of Retirement and Benefits

To: Ajay Desai
Director

Date: November 12, 2020

Thru: Kevin Worley KW
Chief Financial Officer

From: Christina Maiquis CM
Accounting Unit Supervisor

Subject: FY 2022 HRA Employer Contribution Amounts

Alaska Statute 39.30.370 "Contributions by Employers" relates to the employer contributions required to fund the Health Reimbursement Arrangement (HRA) Plan for Public Employees' Retirement System (PERS) and Teachers' Retirement System (TRS) Defined Contribution Retirement (DCR) Plan members. The statute states in part:

> *For each member of the plan, an employer shall contribute to the teachers' (TRS) and public employees' (PERS) retiree health reimbursement arrangement plan trust fund an amount equal to three percent of the average annual compensation of all employees of all employers in the teachers' retirement system and public employees' retirement system. The administrator shall maintain a record for each member to account for employer contributions on behalf of that member.*

In order to compute the dollar amount required to fund the PERS and TRS HRA Plan, a rate of 3.00% is applied to the average annual compensation of all employees of all employers in PERS and TRS. Contributions to a DCR members HRA account are required each pay period in which the employee is enrolled in the Defined Contribution Retirement (DCR) Plan, regardless of the compensation paid during the calendar year. By definition, the HRA employer contribution is a dollar amount.

The Fiscal Year 2022 HRA employer contribution amounts are shown below:

FY 2022 HRA Amounts

Annual	Quarterly	Monthly	Semi-monthly	Bi-weekly	Weekly	Hourly
$2,168.40	$542.10	$180.70	$90.35	$83.40	$41.70	$1.39

The attached document shows a comparative of HRA rates since Fiscal Year 2008.

Approved:

Kevin Worley, Chief Financial Officer

Nov. 12, 2020
Date

Attachment

G:\DRB\Accounting\HRA\HRA Contribution Amounts\FY 2022\FY 2022 HRA Contribution Approval Memo doc

Division of Retirement & Benefits
Health Reimbursement Arrangement (HRA)
Employer contribution amounts by fiscal year

Fiscal Year	Annual	Annual Percentage of Change	Quarterly	Monthly	Semi-monthly	Bi-weekly	Weekly	Hourly
2008	1,531.27	-	382.82	127.61	63.80	58.89	-	0.98
2009	1,616.81	5.59%	404.20	134.73	67.37	62.18	-	1.04
2010	1,699.71	5.13%	424.93	141.64	70.82	65.37	-	1.09
2011	1,720.70	1.23%	430.17	143.39	71.70	66.18	-	1.10
2012	1,778.09	3.34%	444.52	148.17	74.09	68.39	-	1.14
2013	1,848.43	3.96%	462.11	154.04	77.02	71.09	-	1.18
2014	1,896.60	2.61%	474.15	158.05	79.03	72.95	-	1.22
2015	1,960.53	3.37%	490.13	163.38	81.69	75.41	37.70	1.26
2016	2,004.52	2.24%	501.13	167.04	83.52	77.10	38.55	1.28
2017	2,049.36	2.24%	512.34	170.78	85.39	78.82	39.41	1.31
2018	2,084.16	1.70%	521.04	173.68	86.84	80.16	40.08	1.34
2019	2,102.88	0.90%	525.72	175.24	87.62	80.88	40.44	1.35
2020	2,121.60	0.89%	530.40	176.80	88.40	81.60	40.80	1.36
2021	2,159.04	1.76%	539.76	179.92	89.96	83.04	41.52	1.38
2022	2,168.40	0.43%	542.10	180.70	90.35	83.40	41.70	1.39

NOTE: For fiscal year 2007, HRA amounts were computed by employer rather than the HRA as a plan. Beginning fiscal year 2008, HRA amounts were computed and applied uniformly to all members and are reflected above.

ALASKA RETIREMENT MANAGEMENT BOARD

STAFF REPORT

Disclosure - Calendar Update
December 3, 2020

The 3rd Quarter Disclosure Memorandum and Communications Memorandum are included in the packet; no disclosure transactions require additional review or discussion.

The remaining 2020 calendar is attached, along with a copy of 2021 ARMB Calendar. The ARMB website will be updated to reflect the most current calendars.

Nothing further to report.

ALASKA RETIREMENT MANAGEMENT BOARD
M E M O R A N D U M

To: ARMB Trustees
From: Alysia Jones
Date: November 18, 2020
Subject: Financial Disclosures

As required by AS 37.10.230 and Alaska Retirement Management Board policy relating to investment conduct and reporting, trustees and staff must disclose certain financial interests. We are hereby submitting to you a list of disclosures for individual transactions made by trustees and staff.

3rd Quarter – July 1, 2020 to September 30, 2020

Name	Position Title	Disclosure Type	Disclosure Date
Dennis Moen	ARMB Trustee (PERS Seat)	Equities	8/26/2020
Hunter Romberg	Treasury Accounting Staff	Equities	10/01/2020
Jerrold Mitchell	Investment Advisory Council Member	Equities	10/06/2020
Michelle Prebula	State Investment Officer	Equities	10/26/2020

ALASKA RETIREMENT MANAGEMENT BOARD
M E M O R A N D U M

To: ARMB Trustees
From: Alysia Jones
Date: December 1, 2020
Subject: Communications & Information Requests

Communications to Trustees
The following is a list of communications directed to the Board, that were received since the ARMB September 17-18, 2020 meeting.

Name	Type	Contact Date	Topic
Suzanne Cohen	Email	11/09/2020	Climate Change Risk to Investment
Suzanne Cohen	Email	11/23/2020	Investments and Climate Risk
Suzanne Cohen	Email	12/01/2020	Dodd Frank and Climate Change Solutions

Communications Sent from the Board/ Chair

To	Type	Contact Date	Topic
Norman West	Letter *(Electronic & HC)*	11/09/2020	Letter of Appreciation for service on ARMB *(Included under IX. Chair Report)*

Public Records Requests
From September 17 to December 1, 2020

Topics	# of Requests	Description
Quarterly Investment Info.	6	Investment pools, hedge funds/absolute return, real estate, private debt
Meeting Materials	4	Presentations from past meetings, minutes, audio files, transcripts.
Portfolio of Pension Fund	1	
Asset Allocation	1	Reports from FY 2001 - 2009

ALASKA RETIREMENT MANAGEMENT BOARD 2020 Meeting Calendar		
DATE	**LOCATION**	**DESCRIPTION**
December 2 Wednesday	Telephonic	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee
December 3-4 **Thursday-Friday**	**Telephonic**	**Board of Trustees Meeting:** **Audit Report - DRB Auditor* **Performance Measurement – 3rd Quarter* **Manager Review (Questionnaire)* **Private Equity Evaluation - Callan LLC* **Review Private Equity Annual Plan* **Manager Presentations*

ALASKA RETIREMENT MANAGEMENT BOARD
2021 Meeting Calendar

DATE	LOCATION	DESCRIPTION
March 17 Wednesday	Telephonic	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee
March 18-19 **Thursday-Friday**	**Telephonic**	**Board of Trustees Meeting:** **Performance Measurement – 4th Quarter* **Buck Draft Actuarial Report/GRS Draft Actuary Certification* **Capital Markets – Asset Allocation* **Manager Presentations*
April 29 Thursday	TBD	Actuarial Committee **As necessary: follow-up/additional discussion/questions on valuations*
April 30 **Friday**	**TBD**	**Board of Trustees Meeting** **As necessary*
June 16 Wednesday	Juneau, AK	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee
June 17-18 **Thursday - Friday**	**Juneau, AK**	**Board of Trustees Meeting:** **Final Actuary Reports/Adopt Valuation* **Adopt Asset Allocation* **Performance Measurement - 1st Quarter* **Manager Presentations*
September 22 Wednesday	Juneau, AK	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee
September 23-24 **Thursday - Friday**	**Juneau, AK**	**Board of Trustees Meeting:** **Set Contribution Rates* **Audit Results/Assets – Auditor* **Approve Budget* **Performance Measurement – 2nd Quarter* **Real Estate Annual Plan* **Real Assets Evaluation – Callan LLC* **Manager Presentations*
October 13 Tuesday (placeholder)	Telephonic	Audit Committee
December 1 Wednesday	Juneau, AK	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee
December 2-3 **Thursday-Friday**	**Juneau, AK**	**Board of Trustees Meeting:** **Audit Report - DRB Auditor* **Performance Measurement – 3rd Quarter* **Manager Review (Questionnaire)* **Private Equity Evaluation - Callan LLC* **Review Private Equity Annual Plan* **Manager Presentations*

NOTE: Meeting locations and topics are subject to change.

THE STATE of ALASKA
GOVERNOR MIKE DUNLEAVY

Department of Revenue
ALASKA RETIREMENT MANAGEMENT BOARD

PO Box 110405
Juneau, Alaska 99811-0405
Main: 907.465.3749
Fax: 907.465.4397

Chief Investment Officer Report

December 3, 2020

1. CIO Update
2. Annual ARMB Manager review meeting with the IAC, Callan, and staff – 11/4/20
3. Watch List:
   a. No manager currently on the watch list
   b. No managers recommended for watch list placement
4. 9/1/20 - Transitioned to SSGA securities-lending passive equity funds
5. 9/9/20 - Private Equity – $100 million committed to Neuberger Berman Secondary Fund
6. 9/16/20 - Approved the cross trade of securities to other accounts managed by Schroders as part of the wind down of the Schroders insurance-linked securities account.
7. Portfolio Transaction Update from September to October 2020

Individual Manager Transactions
September 2020 - October 2020

Asset Class	Total
Broad Domestic Equity (DE)	(386,035,237)
Global Equity Ex-US (IE)	(146,041,130)
Fixed Income (FI)	535,076,367
Real Assets (Real)	-
Private Equity (PE)	-
Opportunistic (Opp)	(3,000,000)
Total	-

Manager	Total	Fund	Asset Class	Description of Large Transactions
Short Term Pool	249,076,367	AY70	FI	Rebalancing
ARMB Barclays Agg Fund	286,000,000	AY77	FI	Rebalancing
Schroder Investment Management	(3,000,000)	AY1H	Opp	
SSGA Transition	(46)	AY30	DE	
ARMB S&P 900	(252,000,000)	AY4L	DE	Rebalancing
Barrow Hanley Mewhinney & Strauss Inc.	(7,313)	AY4U	DE	
Lord Abbett Micro Cap	(5,906)	AY4Z	DE	
Domestic Residual Assets	(15,011)	AY5E	DE	
International Equity Residual Asset	(1,041,130)	AY69	IE	
ARMB S&P 600	(20,000,000)	AYGA	DE	Rebalancing
Zebra Micro Cap	(6,960)	AYKW	DE	
SSGA World ex-US IMI	(68,000,000)	AYL7	IE	Rebalancing
SSGA MSCI Emerging Markets Index Fund	(26,000,000)	AYLB	IE	Rebalancing
ARMB Scientific Beta	(114,000,000)	AYLM	DE	Rebalancing
Arrowstreet Capital	(15,000,000)	AYLQ	IE	Rebalancing
Ballie Gifford	(14,000,000)	AYLR	IE	Rebalancing
LGIMA Sci Beta Developed Non-US	(22,000,000)	AYLS	IE	Rebalancing

ALASKA RETIREMENT MANAGEMENT BOARD

STAFF REPORT

Fund Financials – Cash Flow Report
December 3, 2020

Kayla Wisner, State Comptroller, Department of Revenue

As of October month-end, total plan assets were as follows: PERS - $20.0 billion, TRS - $9.5 billion, JRS - $232.9 million, NGNMRS - $42.9 million, SBS - $4.3 billion, DCP - $1.03 billion. Total non-participant directed plans totaled $27.6 billion, and participant-directed plans totaled $7.5 billion. Total assets were $35.1 billion.

Year-to-date income was $1.5 billion, and the plans experienced a net withdrawal of $143 million. Total assets were up 4.05% year-to-date.

Internally managed assets totaled $14.0 billion

As of month-end, all plans were within the bands of their asset allocations.

Kevin Worley, Chief Financial Officer, Division of Retirement and Benefits

Attached is the Division of Retirement and Benefits (DRB) Supplement to the Treasury Division's Financial Report as of October 31, 2020.

DRB's supplement report expands on the ARMB Financial Report column "Net Contributions (Withdrawals)" located on pages 1 and 2. DRB reports the summary totals of actual employee and employer, State of Alaska, and other revenue contributions, as well as benefit payments, refunds / distributions, and combined administrative / investment expenditures. DRB's report presents cash inflows / outflows for the 4-months ended October 31, 2020 (page 1) and the month of October 2020 (page 2).

Also presented are participant-directed distributions by plan and by type for the 4-month period on page 3. This page also includes Tier information on the defined benefit refunds, and vested percentage on defined contribution distributions.

"Notes for the DRB Supplement to the Treasury Report" includes information for the pension and healthcare plans. Additional information regarding other income is also presented on pages 4 and 5.

ALASKA RETIREMENT MANAGEMENT BOARD
FINANCIAL REPORT

As of October 31, 2020

ALASKA RETIREMENT MANAGEMENT BOARD
Schedule of Investment Income and Changes in Invested Assets by Fund
Fiscal Year-to-Date through October 31, 2020

	Beginning Invested Assets	Investment Income (1)	Net Contributions (Withdrawals)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (2)
Public Employees' Retirement System (PERS)						
Defined Benefit Plans:						
Retirement Trust	$ 9,344,522,576	$ 425,998,543	$ 9,156,953	$ 9,779,678,072	4.66%	4.56%
Retirement Health Care Trust	7,755,155,160	348,701,132	(110,340,734)	7,993,515,558	3.07%	4.53%
Total Defined Benefit Plans	17,099,677,736	774,699,675	(101,183,781)	17,773,193,630	3.94%	4.54%
Defined Contribution Plans:						
Participant Directed Retirement	1,394,890,476	70,992,438	36,714,286	1,502,597,200	7.72%	5.02%
Health Reimbursement Arrangement	477,547,046	21,394,393	13,984,703	512,926,142	7.41%	4.42%
Retiree Medical Plan	139,052,827	6,223,991	5,519,810	150,796,628	8.45%	4.39%
Defined Benefit Occupational Death and Disability:						
Public Employees	28,652,603	1,281,960	1,071,551	31,006,114	8.21%	4.39%
Police and Firefighters	12,730,849	570,945	342,541	13,644,335	7.18%	4.43%
Total Defined Contribution Plans	2,052,873,801	100,463,727	57,632,891	2,210,970,419	7.70%	4.83%
Total PERS	**19,152,551,537**	**875,163,402**	**(43,550,890)**	**19,984,164,049**	4.34%	4.57%
Teachers' Retirement System (TRS)						
Defined Benefit Plans:						
Retirement Trust	5,375,743,401	246,081,244	(18,260,352)	5,603,564,293	4.24%	4.59%
Retirement Health Care Trust	2,928,208,583	131,671,775	(35,913,657)	3,023,966,701	3.27%	4.52%
Total Defined Benefit Plans	8,303,951,984	377,753,019	(54,174,009)	8,627,530,994	3.90%	4.56%
Defined Contribution Plans:						
Participant Directed Retirement	581,114,042	30,267,656	4,322,879	615,704,577	5.95%	5.19%
Health Reimbursement Arrangement	140,990,637	6,345,834	3,207,246	150,543,717	6.78%	4.45%
Retiree Medical Plan	47,385,507	2,135,550	948,168	50,469,225	6.51%	4.46%
Defined Benefit Occupational Death and Disability	4,732,927	213,158	70,750	5,016,835	6.00%	4.47%
Total Defined Contribution Plans	774,223,113	38,962,198	8,549,043	821,734,354	6.14%	5.00%
Total TRS	**9,078,175,097**	**416,715,217**	**(45,624,966)**	**9,449,265,348**	4.09%	4.60%
Judicial Retirement System (JRS)						
Defined Benefit Plan Retirement Trust	186,740,196	8,550,900	2,771,988	198,063,084	6.06%	4.55%
Defined Benefit Retirement Health Care Trust	33,653,239	1,512,868	(314,674)	34,851,433	3.56%	4.52%
Total JRS	**220,393,435**	**10,063,768**	**2,457,314**	**232,914,517**	5.68%	4.54%
National Guard/Naval Militia Retirement System (MRS)						
Defined Benefit Plan Retirement Trust	42,120,154	1,454,370	(720,128)	42,854,396	1.74%	3.48%
Other Participant Directed Plans						
Supplemental Annuity Plan	4,226,458,219	161,854,109	(46,205,305)	4,342,107,023	2.74%	3.85%
Deferred Compensation Plan	998,966,337	43,707,576	(9,307,150)	1,033,366,763	3.44%	4.40%
Total All Funds	**33,718,664,779**	**1,508,958,442**	**(142,951,125)**	**35,084,672,096**		
Total Non-Participant Directed	26,517,235,705	1,202,136,663	(128,475,835)	27,590,896,533	4.05%	4.54%
Total Participant Directed	7,201,429,074	306,821,779	(14,475,290)	7,493,775,563	4.06%	4.26%
Total All Funds	**$ 33,718,664,779**	**$ 1,508,958,442**	**$ (142,951,125)**	**$ 35,084,672,096**	**4.05%**	**4.48%**

Notes:

(1) Includes interest, dividends, securities lending, expenses, realized and unrealized gains/losses

(2) Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates and can be found at: http://treasury.dor.alaska.gov/armb/Reports-and-Policies/Investment-Performance.aspx

ALASKA RETIREMENT MANAGEMENT BOARD
Schedule of Investment Income and Changes in Invested Assets by Fund
For the Month Ended October 31, 2020

	Beginning Invested Assets	Investment Income (1)	Net Contributions (Withdrawals)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (2)
Public Employees' Retirement System (PERS)						
Defined Benefit Plans:						
Retirement Trust	$ 9,921,120,642	$ (92,956,842)	$ (48,485,728)	$ 9,779,678,072	-1.43%	-0.94%
Retirement Health Care Trust	8,102,396,100	(76,145,268)	(32,735,274)	7,993,515,558	-1.34%	-0.94%
Total Defined Benefit Plans	18,023,516,742	(169,102,110)	(81,221,002)	17,773,193,630	-1.39%	-0.94%
Defined Contribution Plans:						
Participant Directed Retirement	1,511,237,161	(18,994,555)	10,354,594	1,502,597,200	-0.57%	-1.25%
Health Reimbursement Arrangement	514,090,237	(4,949,715)	3,785,620	512,926,142	-0.23%	-0.96%
Retiree Medical Plan	150,838,262	(1,458,408)	1,416,774	150,796,628	-0.03%	-0.96%
Defined Benefit Occupational Death and Disability:						
Public Employees	31,012,174	(300,013)	293,953	31,006,114	-0.02%	-0.96%
Police and Firefighters	13,697,827	(131,030)	77,538	13,644,335	-0.39%	-0.95%
Total Defined Contribution Plans	2,220,875,661	(25,833,721)	15,928,479	2,210,970,419	-0.45%	-1.16%
Total PERS	**20,244,392,403**	**(194,935,831)**	**(65,292,523)**	**19,984,164,049**	-1.29%	-0.96%
Teachers' Retirement System (TRS)						
Defined Benefit Plans:						
Retirement Trust	5,694,144,233	(53,101,637)	(37,478,303)	5,603,564,293	-1.59%	-0.94%
Retirement Health Care Trust	3,062,063,308	(28,812,032)	(9,284,575)	3,023,966,701	-1.24%	-0.94%
Total Defined Benefit Plans	8,756,207,541	(81,913,669)	(46,762,878)	8,627,530,994	-1.47%	-0.94%
Defined Contribution Plans:						
Participant Directed Retirement	619,945,035	(7,901,154)	3,660,696	615,704,577	-0.68%	-1.27%
Health Reimbursement Arrangement	150,908,317	(1,442,893)	1,078,293	150,543,717	-0.24%	-0.95%
Retiree Medical Plan	50,659,824	(483,803)	293,204	50,469,225	-0.38%	-0.95%
Defined Benefit Occupational Death and Disability	5,041,146	(47,999)	23,688	5,016,835	-0.48%	-0.95%
Total Defined Contribution Plans	826,554,322	(9,875,849)	5,055,881	821,734,354	-0.58%	-1.19%
Total TRS	**9,582,761,863**	**(91,789,518)**	**(41,706,997)**	**9,449,265,348**	-1.39%	-0.96%
Judicial Retirement System (JRS)						
Defined Benefit Plan Retirement Trust	200,731,169	(1,884,973)	(783,112)	198,063,084	-1.33%	-0.94%
Defined Benefit Retirement Health Care Trust	35,257,419	(332,740)	(73,246)	34,851,433	-1.15%	-0.94%
Total JRS	**235,988,588**	**(2,217,713)**	**(856,358)**	**232,914,517**	-1.30%	-0.94%
National Guard/Naval Militia Retirement System (MRS)						
Defined Benefit Plan Retirement Trust	43,468,656	(418,267)	(195,993)	42,854,396	-1.41%	-0.96%
Other Participant Directed Plans						
Supplemental Annuity Plan	4,400,443,491	(42,100,476)	(16,235,992)	4,342,107,023	-1.33%	-0.96%
Deferred Compensation Plan	1,044,082,931	(7,944,641)	(2,771,527)	1,033,366,763	-1.03%	-0.76%
Total All Funds	**35,551,137,932**	**(339,406,446)**	**(127,059,390)**	**35,084,672,096**		
Total Non-Participant Directed	27,975,429,314	(262,465,620)	(122,067,161)	27,590,896,533	-1.37%	-0.94%
Total Participant Directed	7,575,708,618	(76,940,826)	(4,992,229)	7,493,775,563	-1.08%	-1.02%
Total All Funds	**$ 35,551,137,932**	**$ (339,406,446)**	**$ (127,059,390)**	**$ 35,084,672,096**	**-1.31%**	**-0.96%**

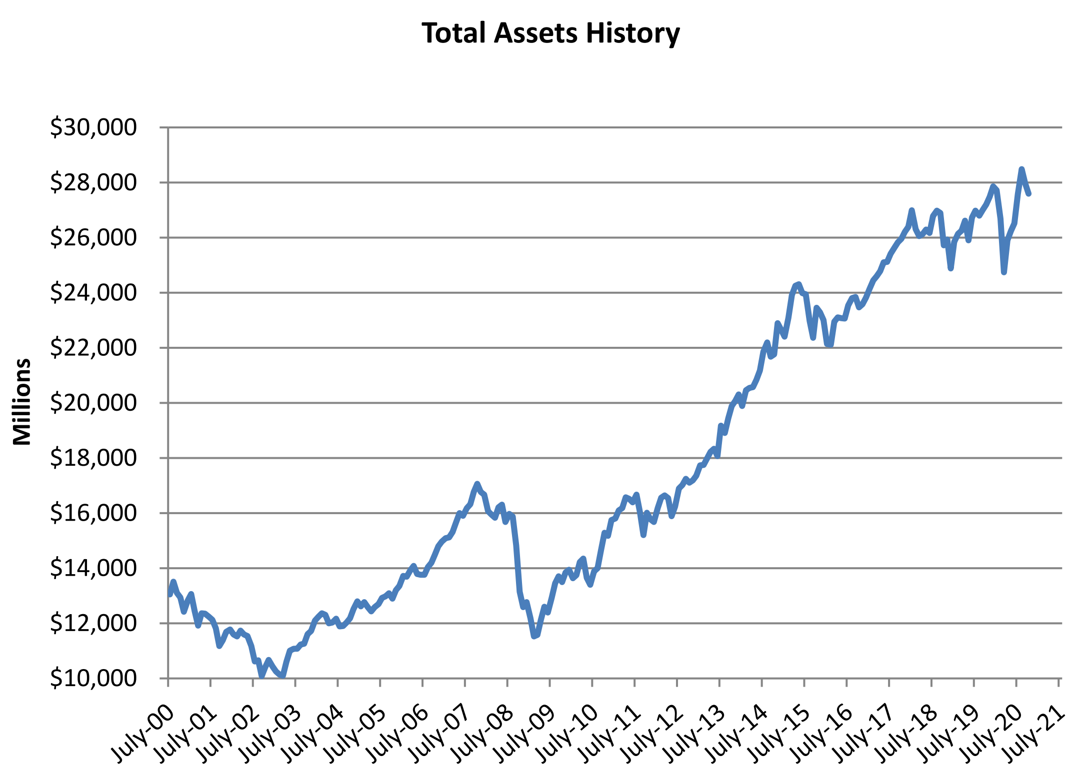
Notes:

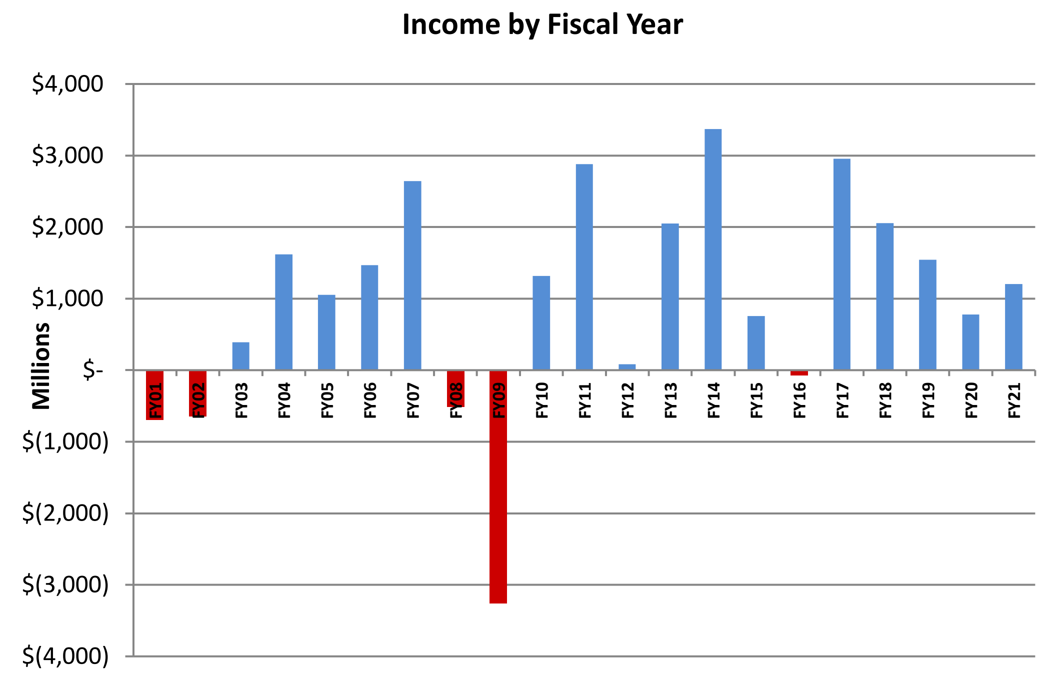
(1) Includes interest, dividends, securities lending, expenses, realized and unrealized gains/losses

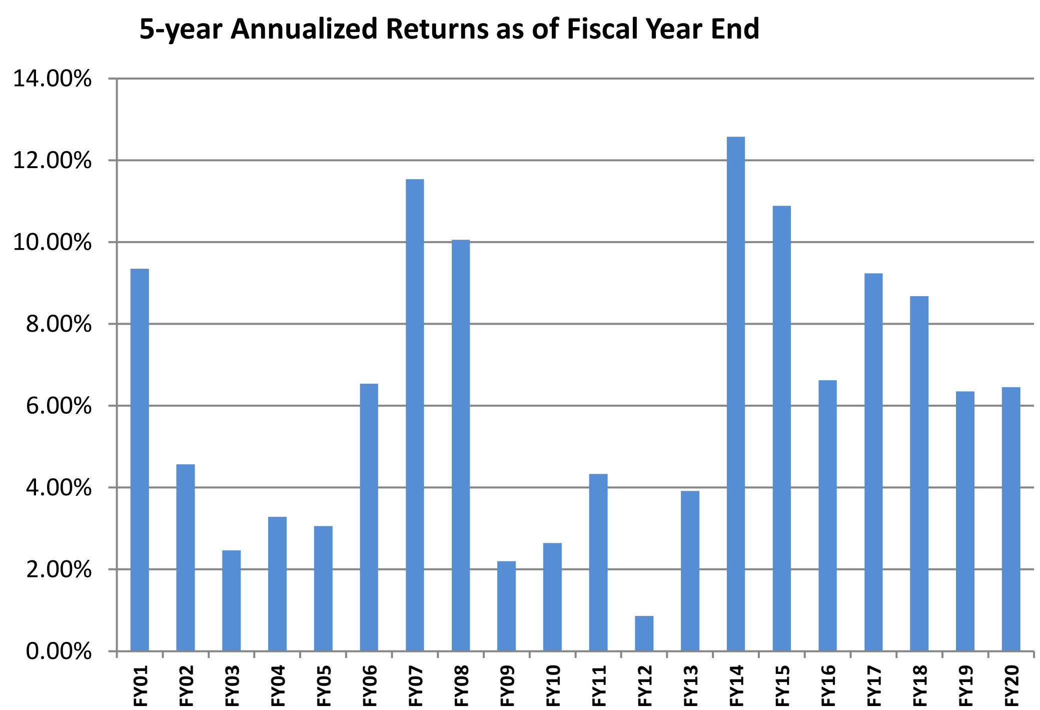
(2) Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates and can be found at: http://treasury.dor.alaska.gov/armb/Reports-and-Policies/Investment-Performance.aspx

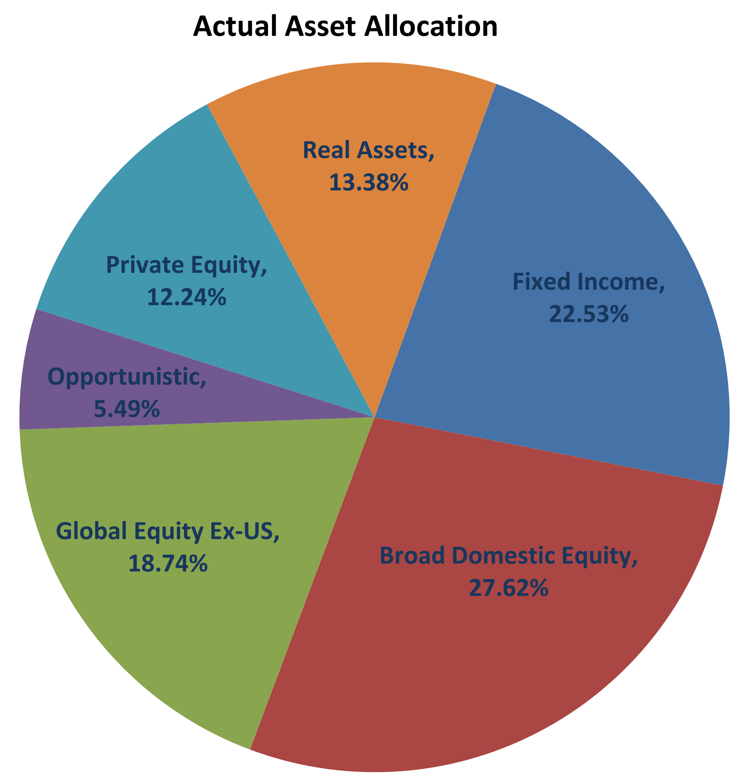
Total Non Participant Directed Assets

As of October 31, 2020



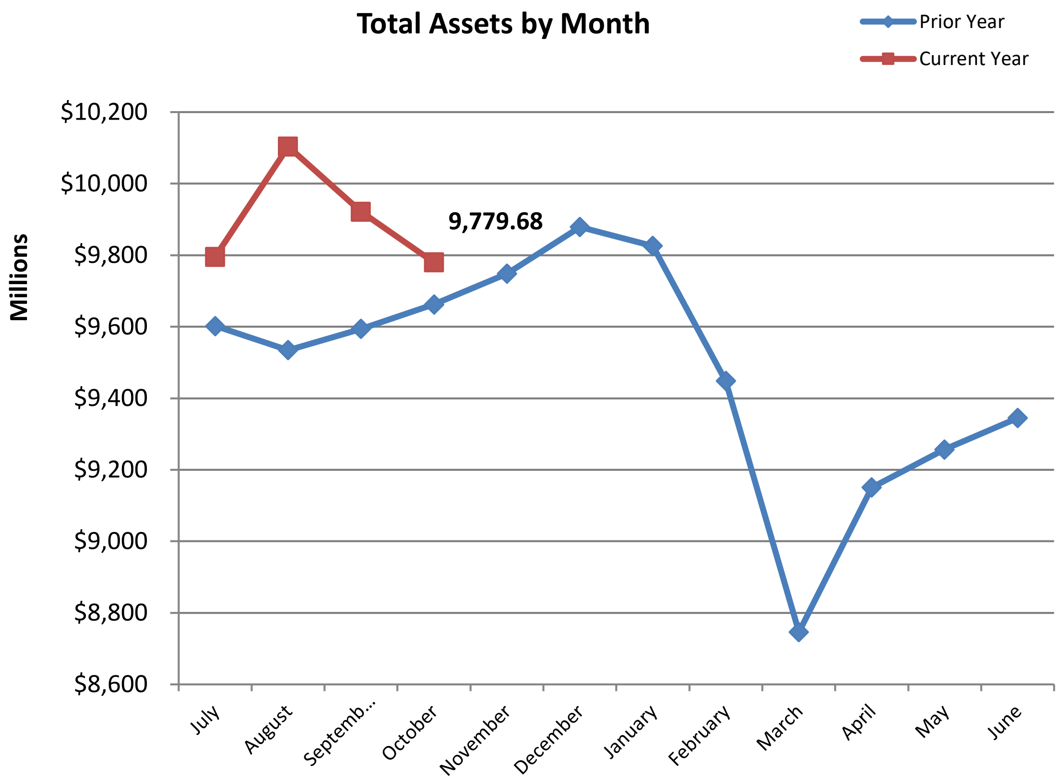


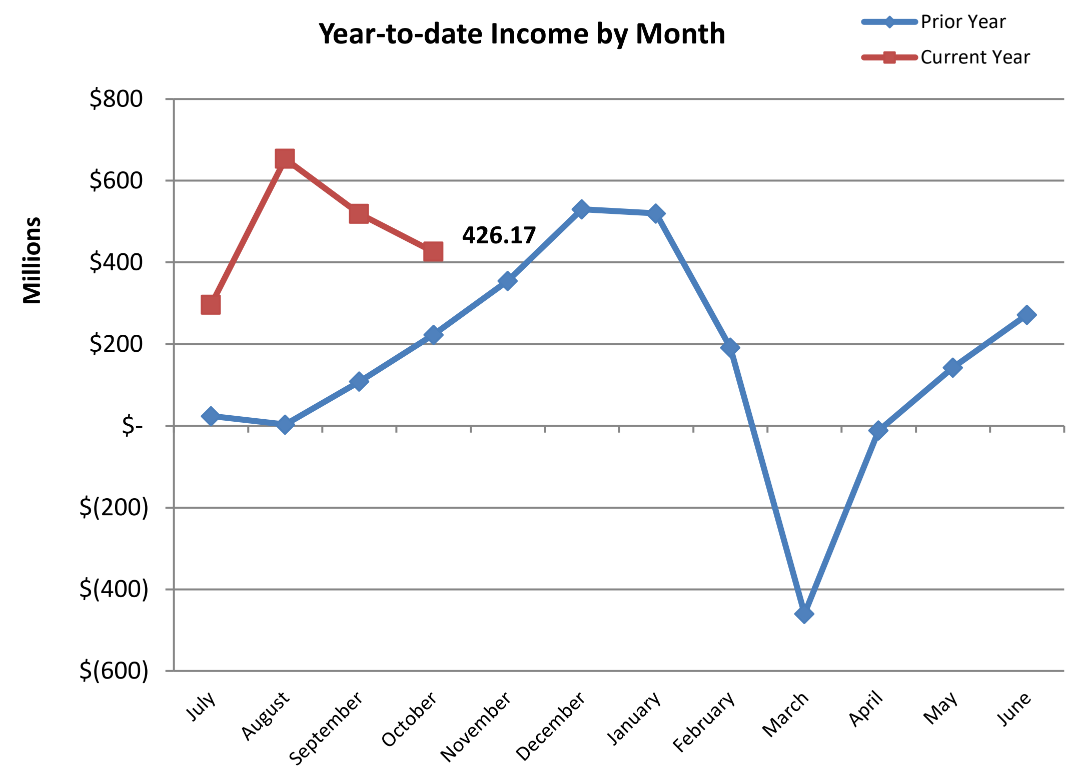


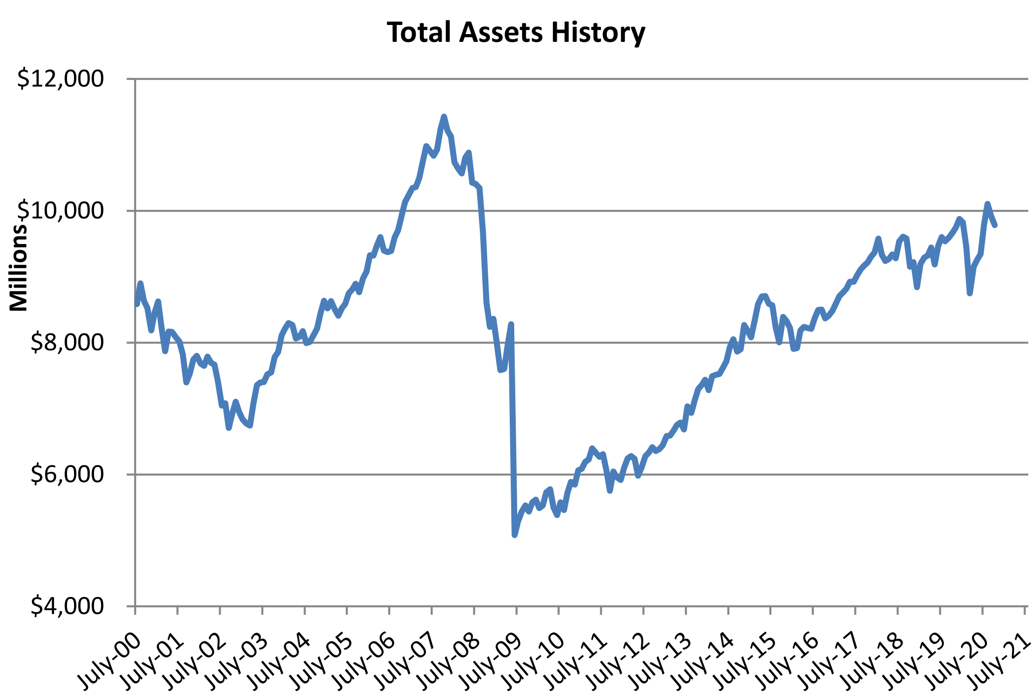


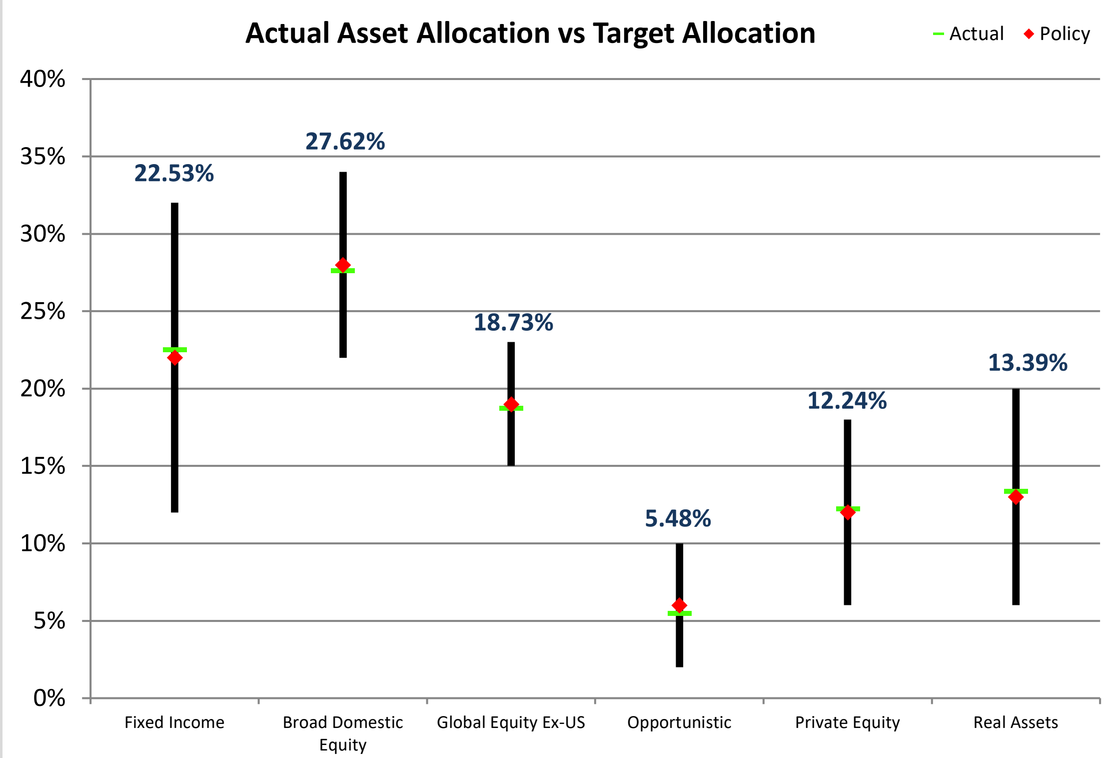
Public Employees' Retirement Pension Trust Fund

Fiscal Year-to-Date through October 31, 2020



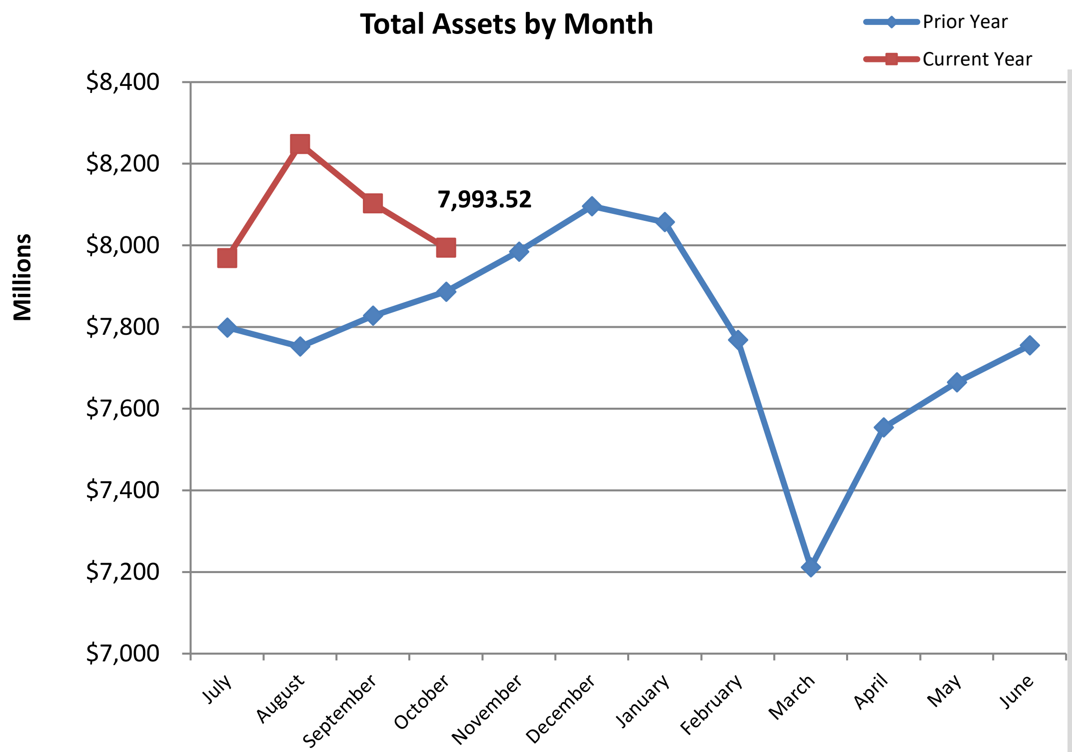


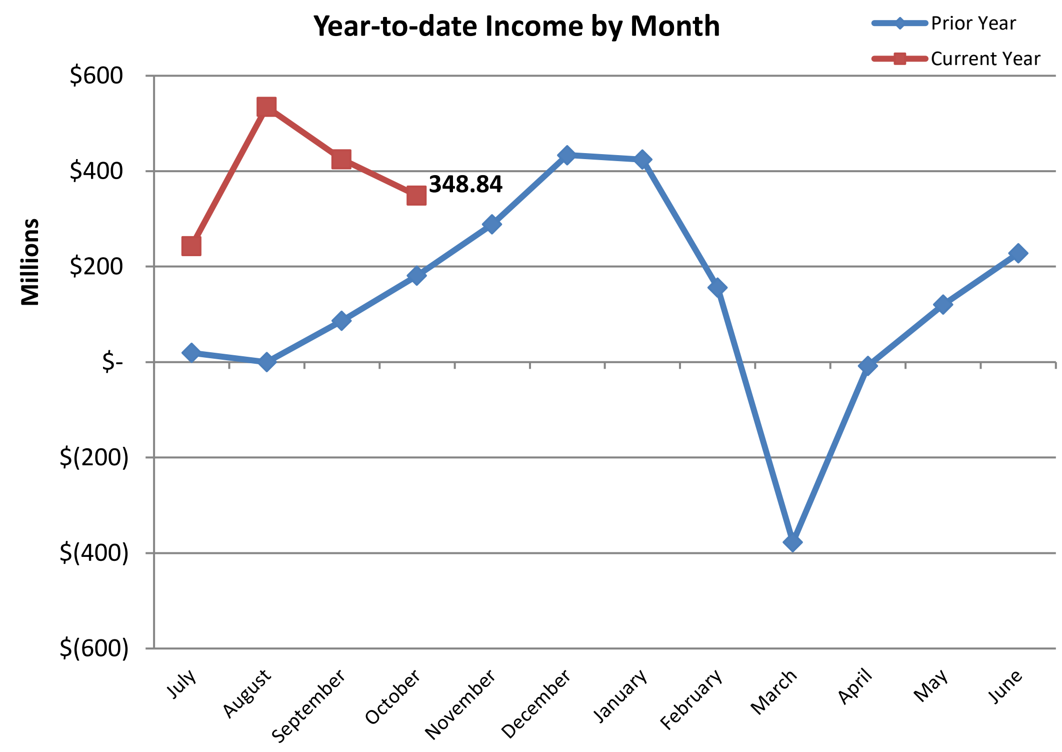


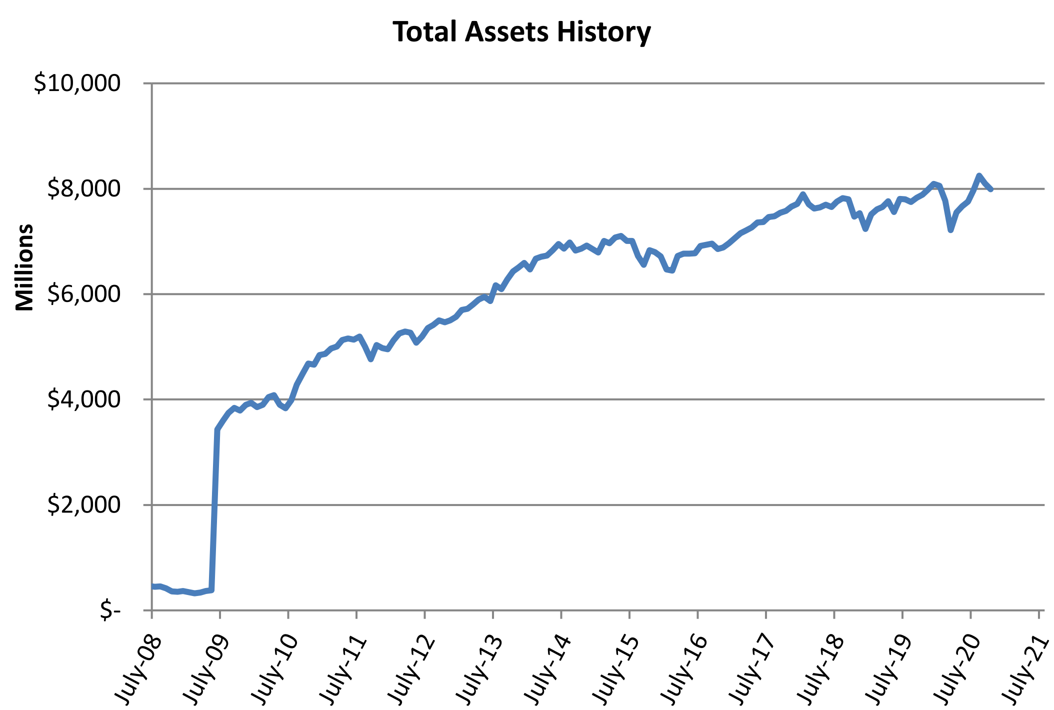


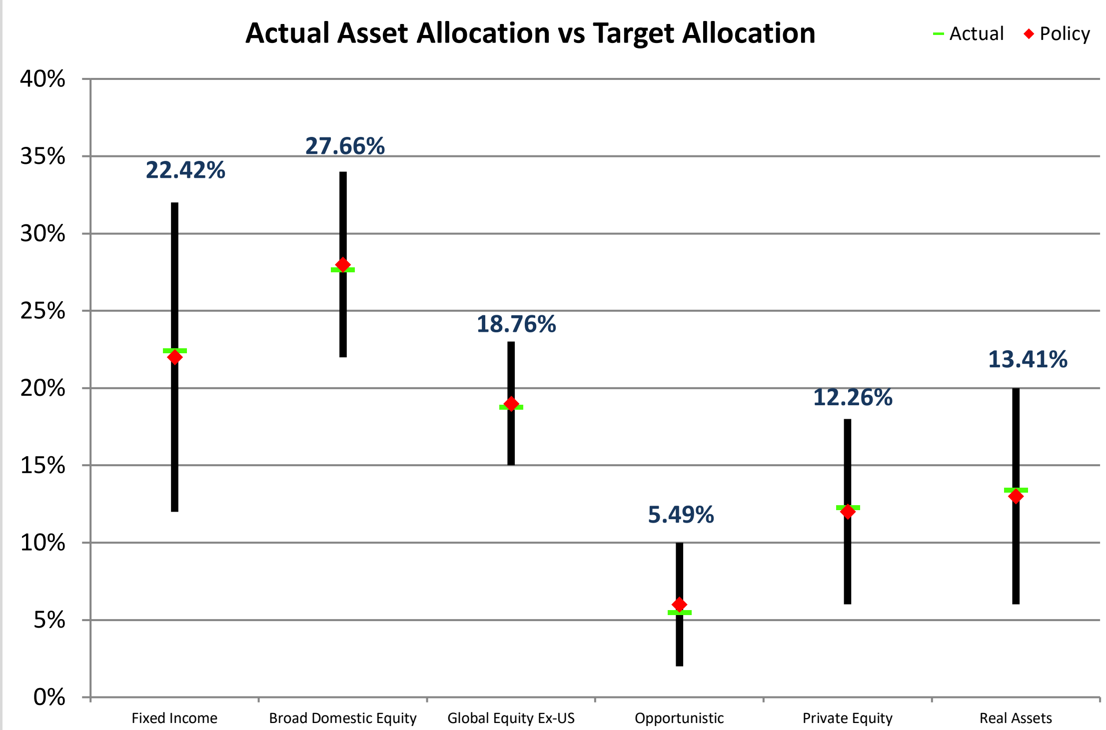
Public Employees' Retirement Health Care Trust Fund

Fiscal Year-to-Date through October 31, 2020



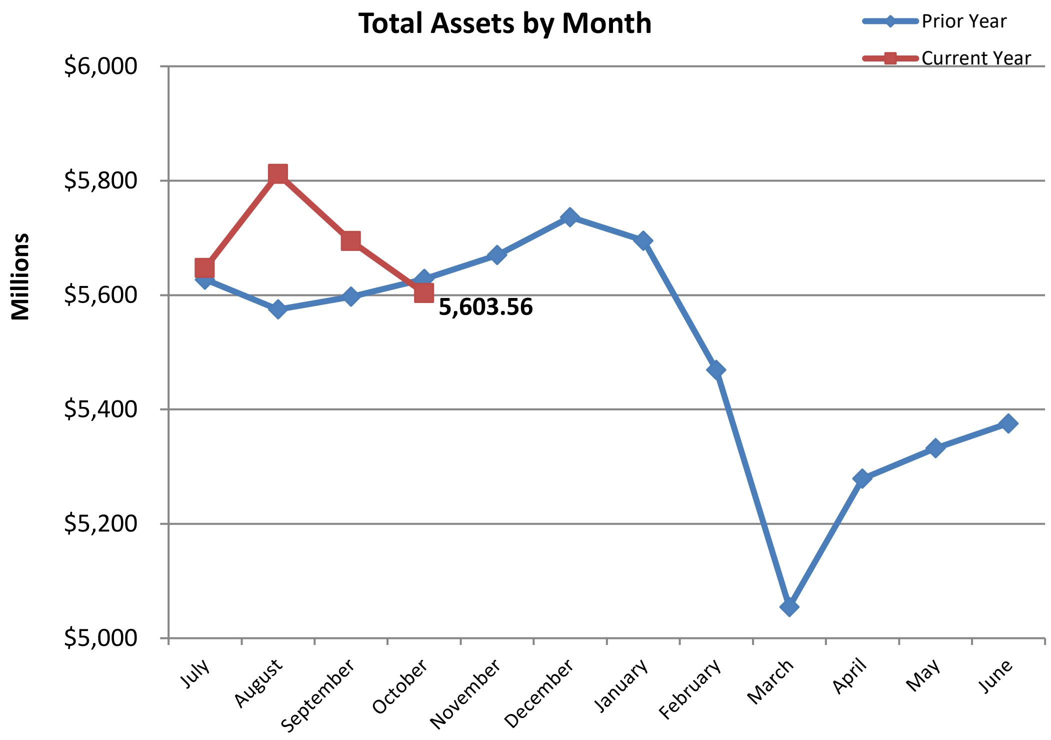


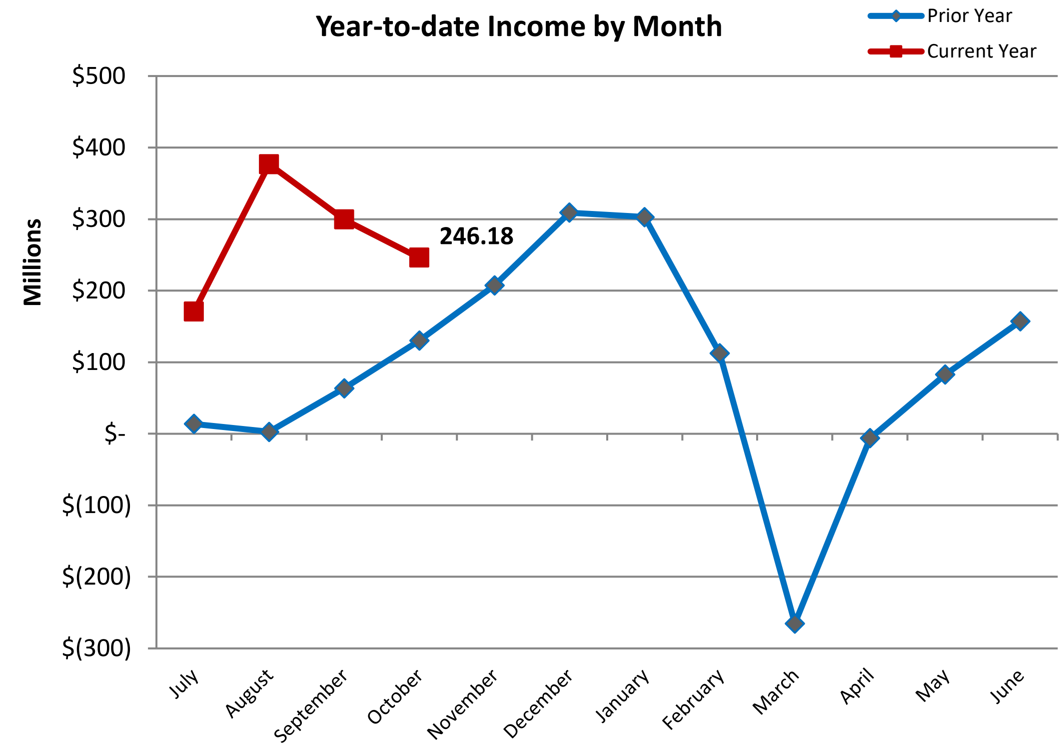


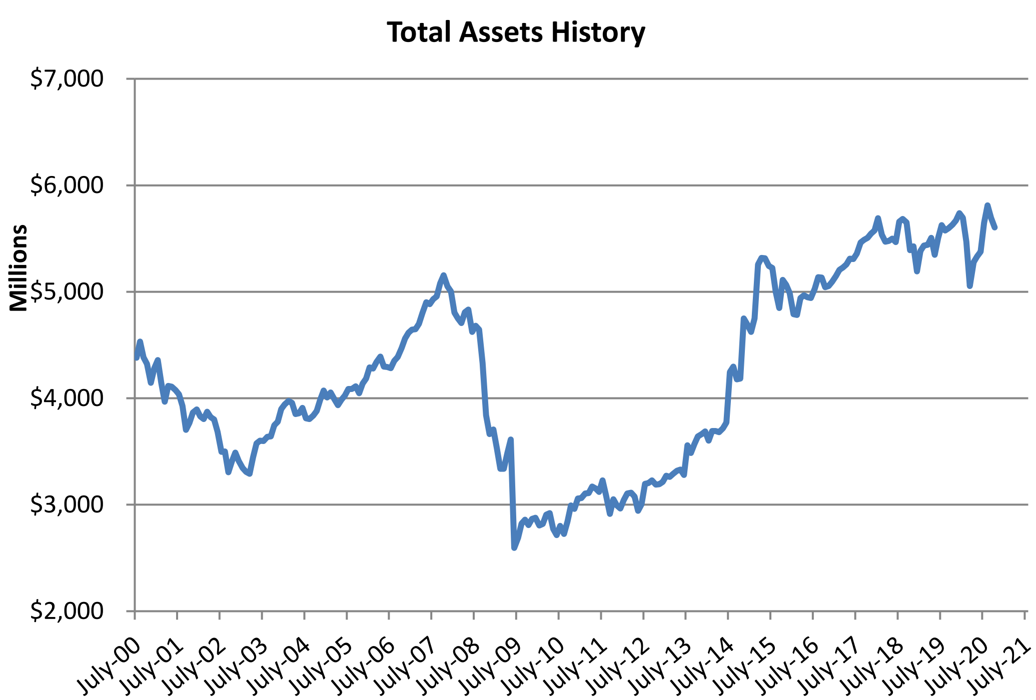


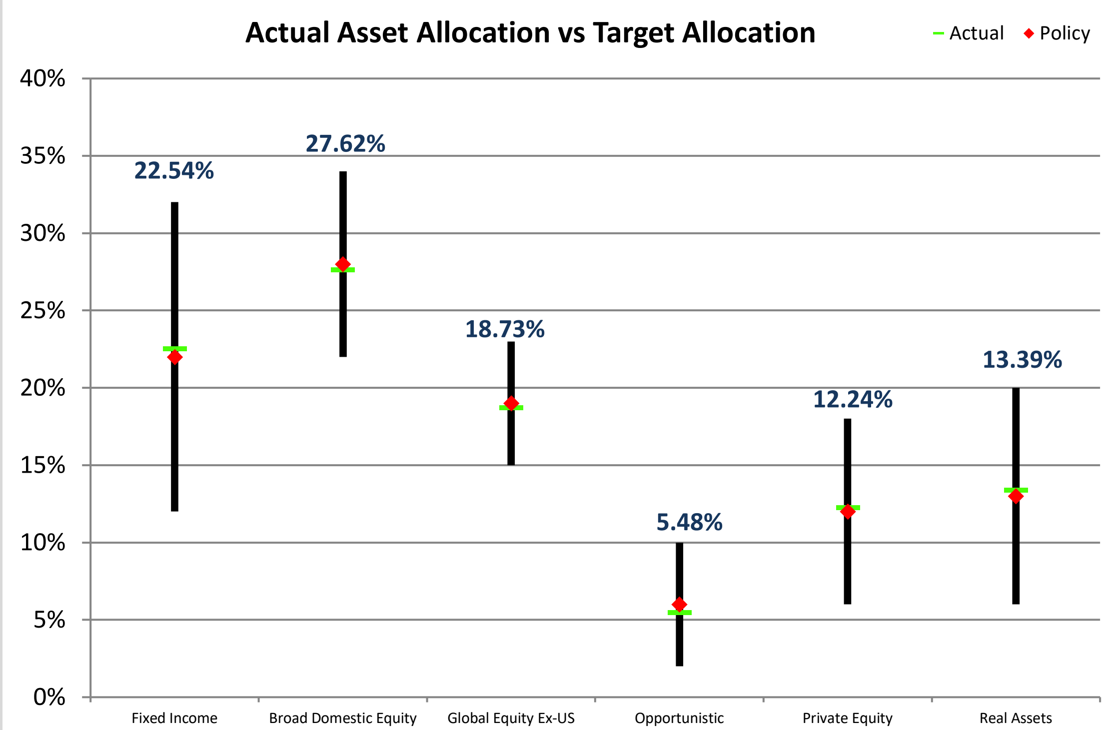
Teachers' Retirement Pension Trust Fund

Fiscal Year-to-Date through October 31, 2020



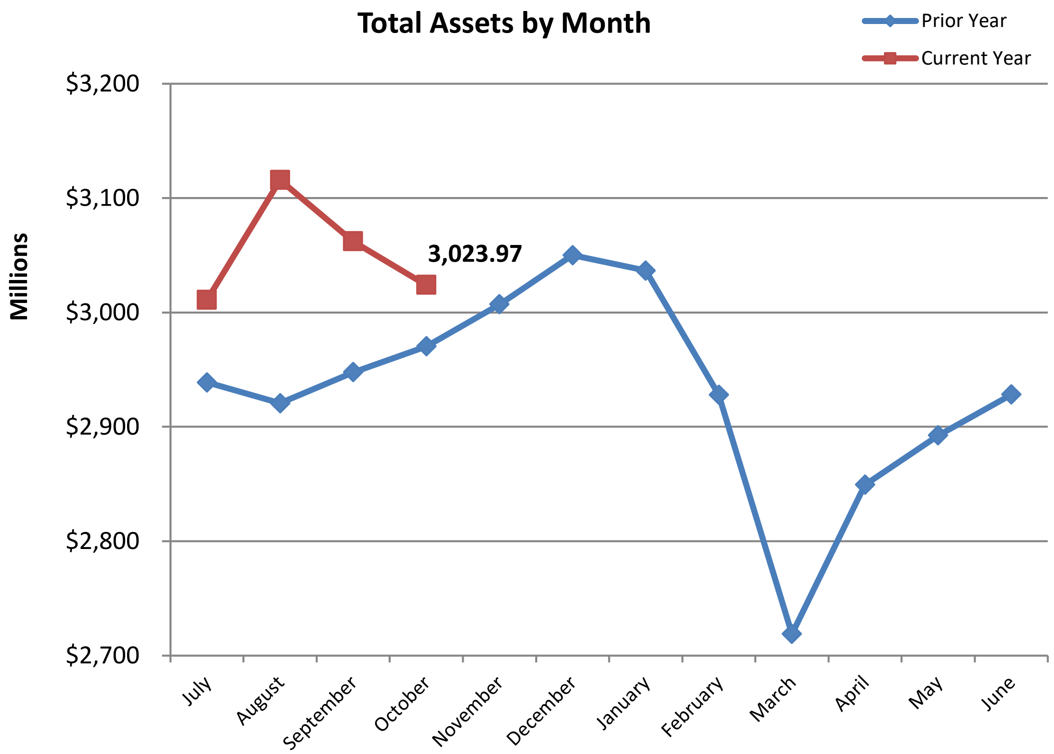


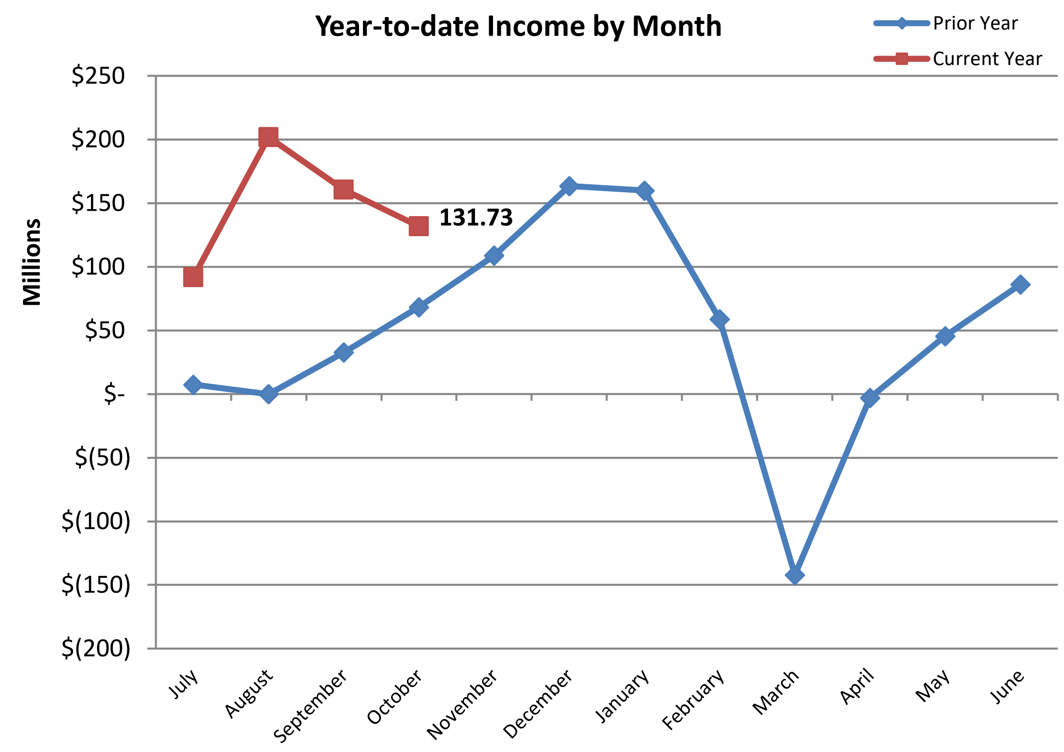


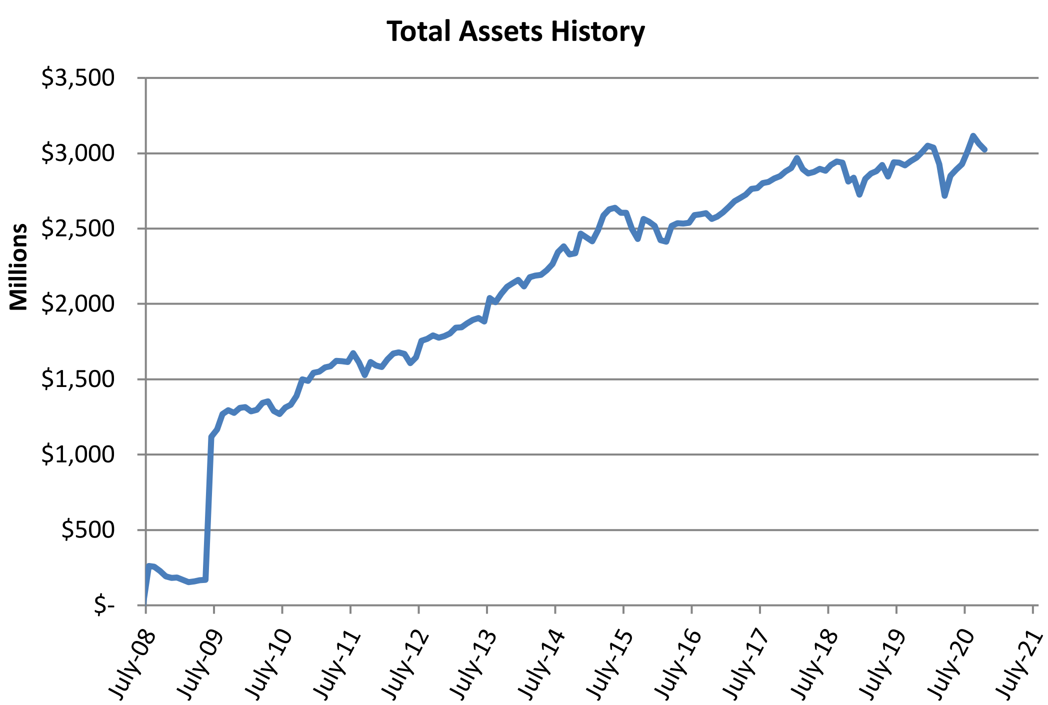


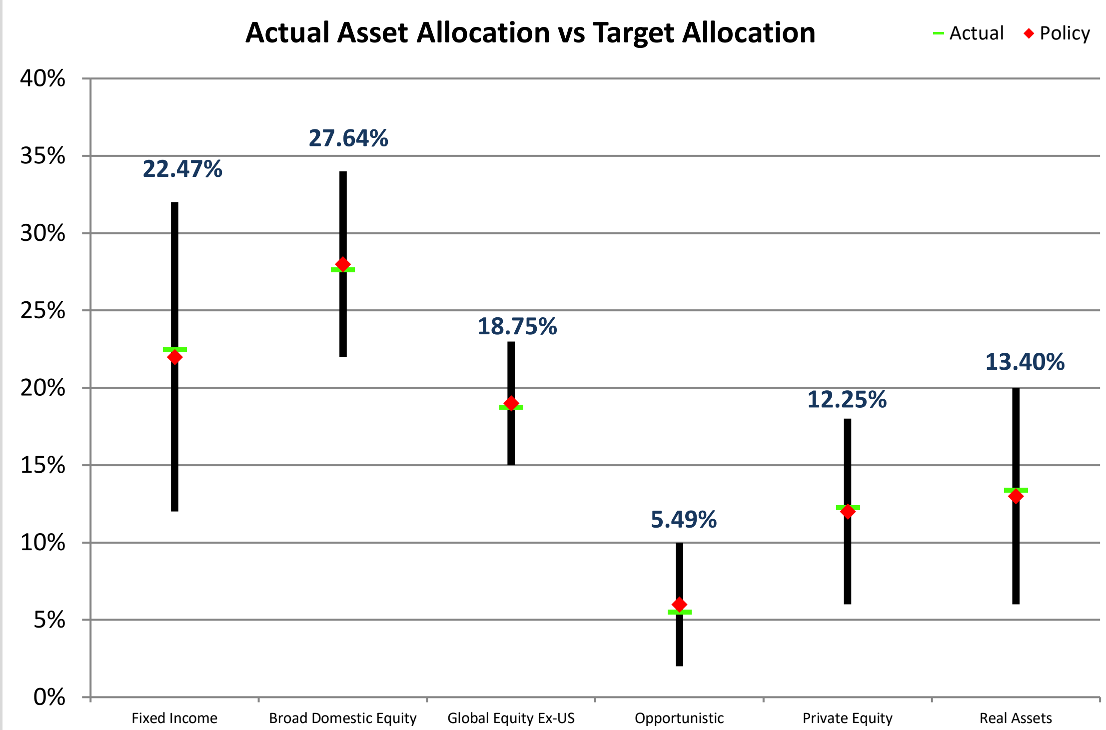
Teachers' Retirement Health Care Trust Fund

Fiscal Year-to-Date through October 31, 2020



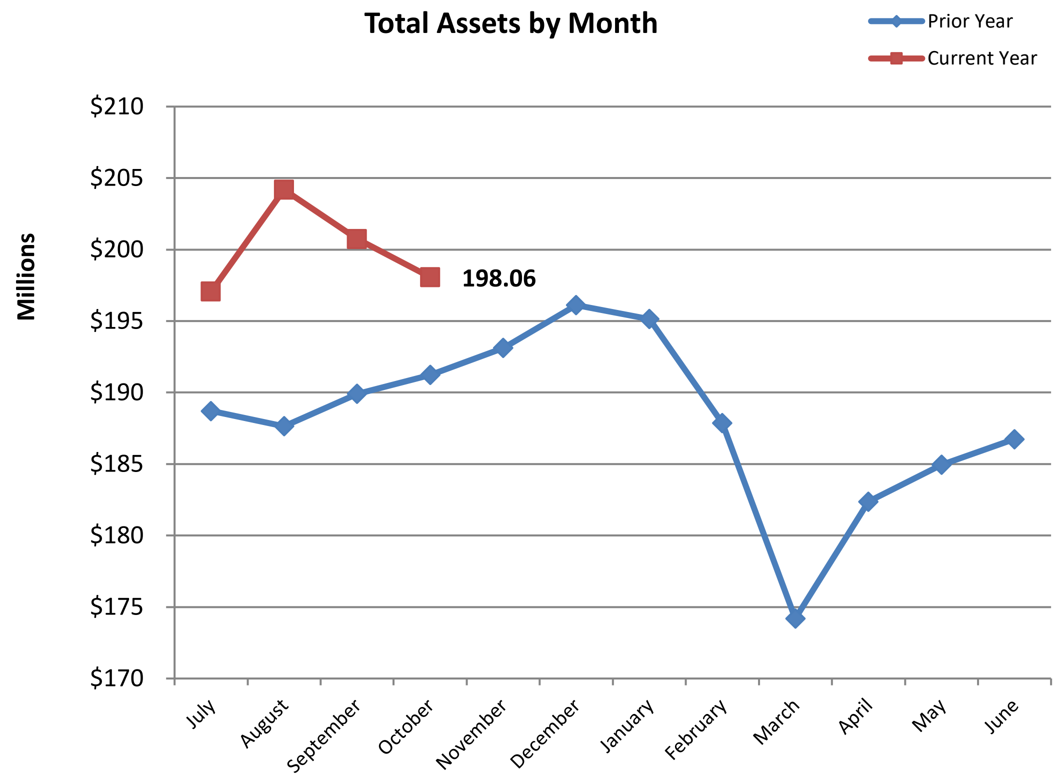


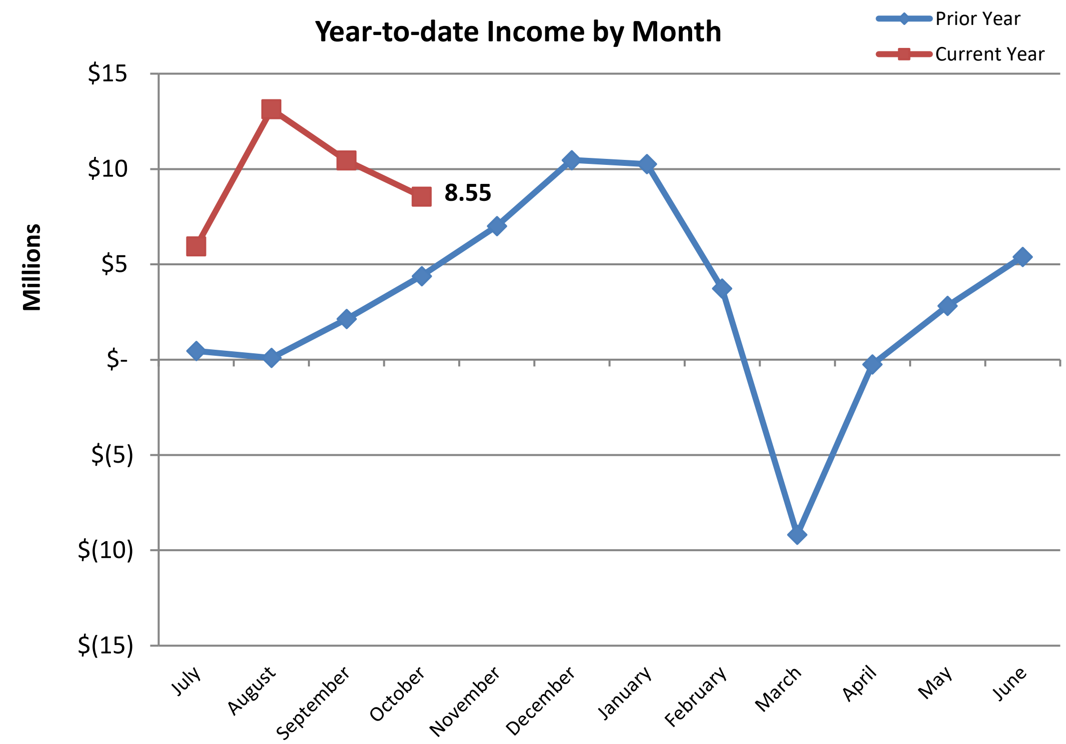


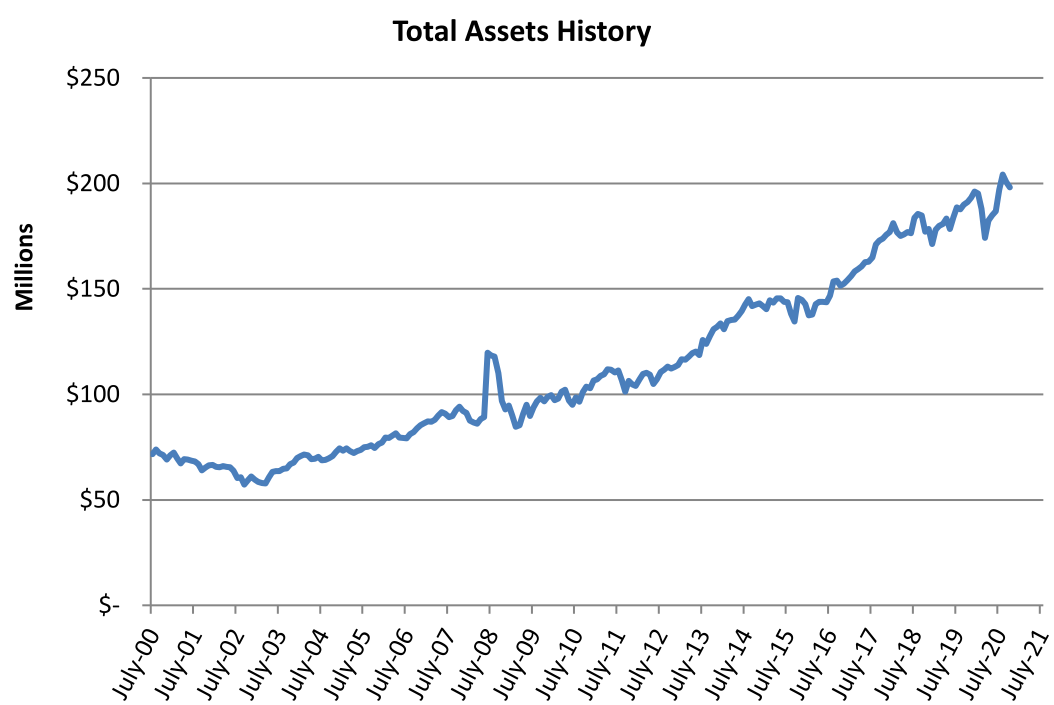


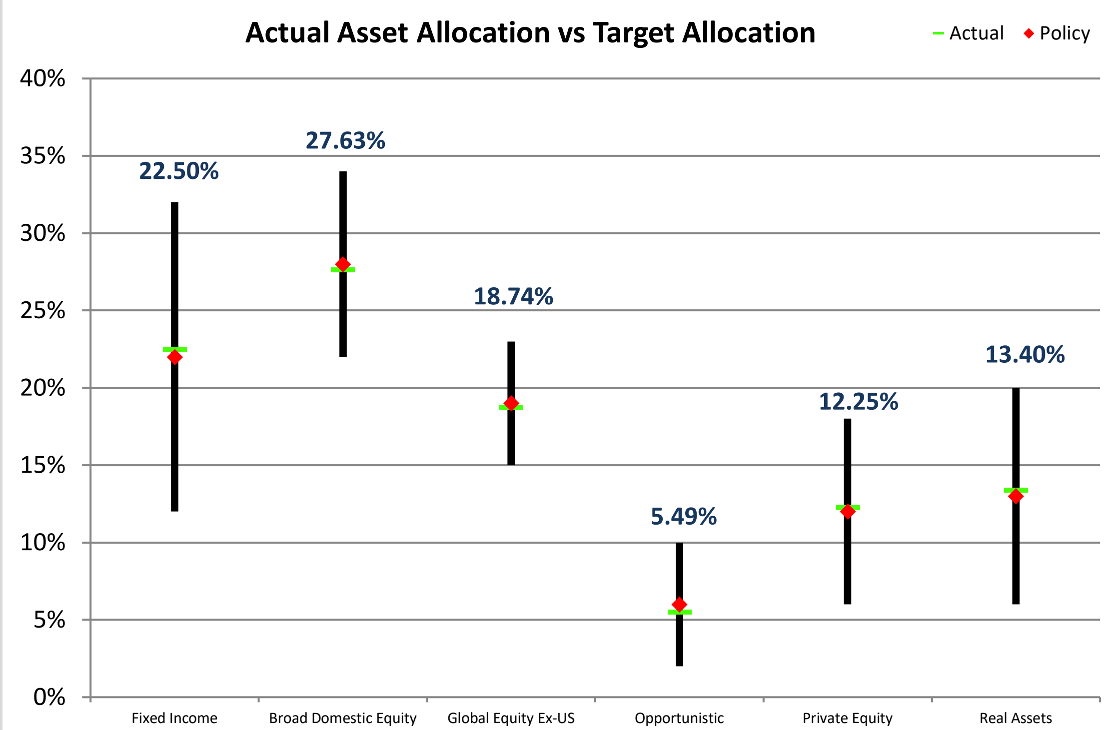
Judicial Retirement Pension Trust Fund

Fiscal Year-to-Date through October 31, 2020



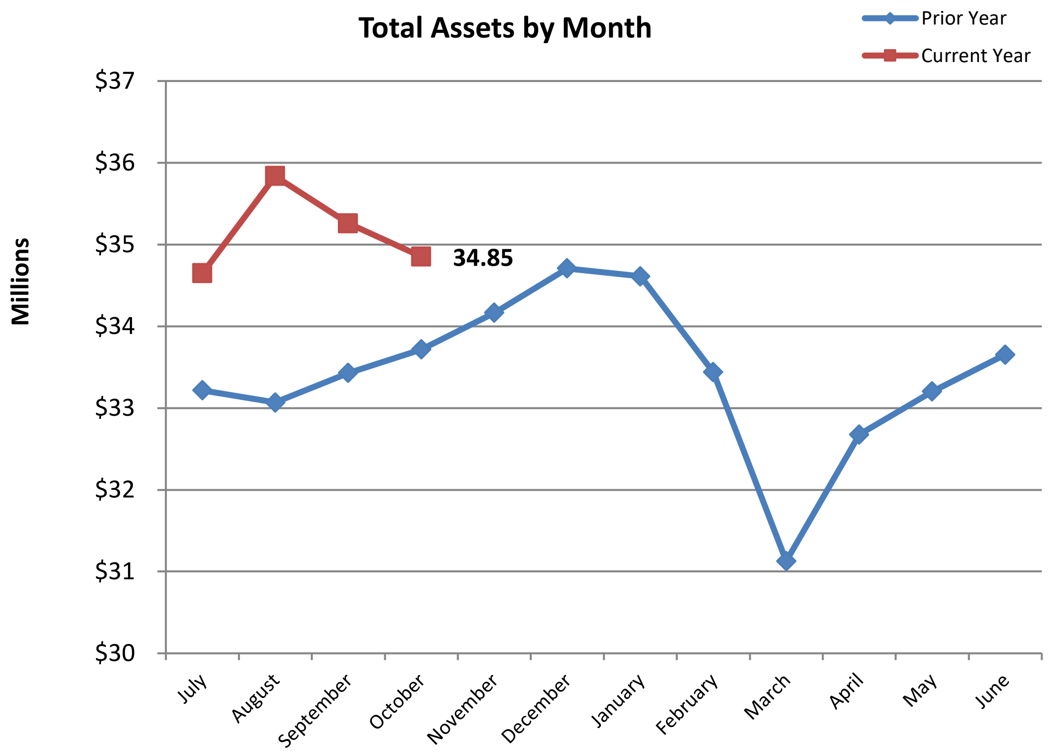


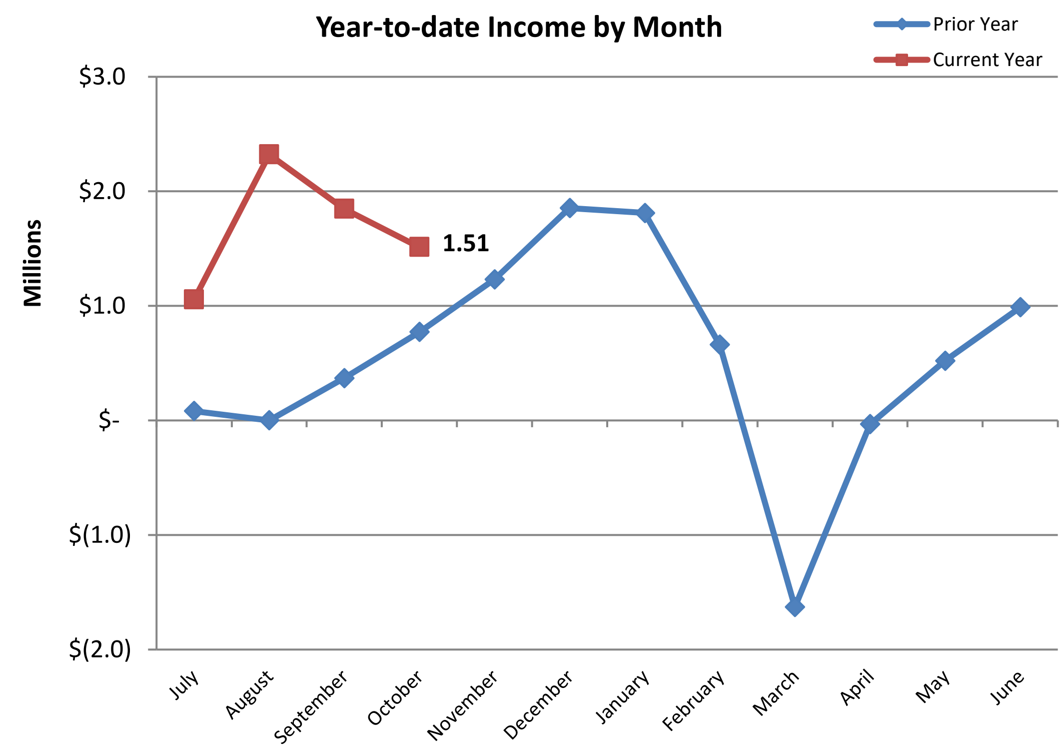


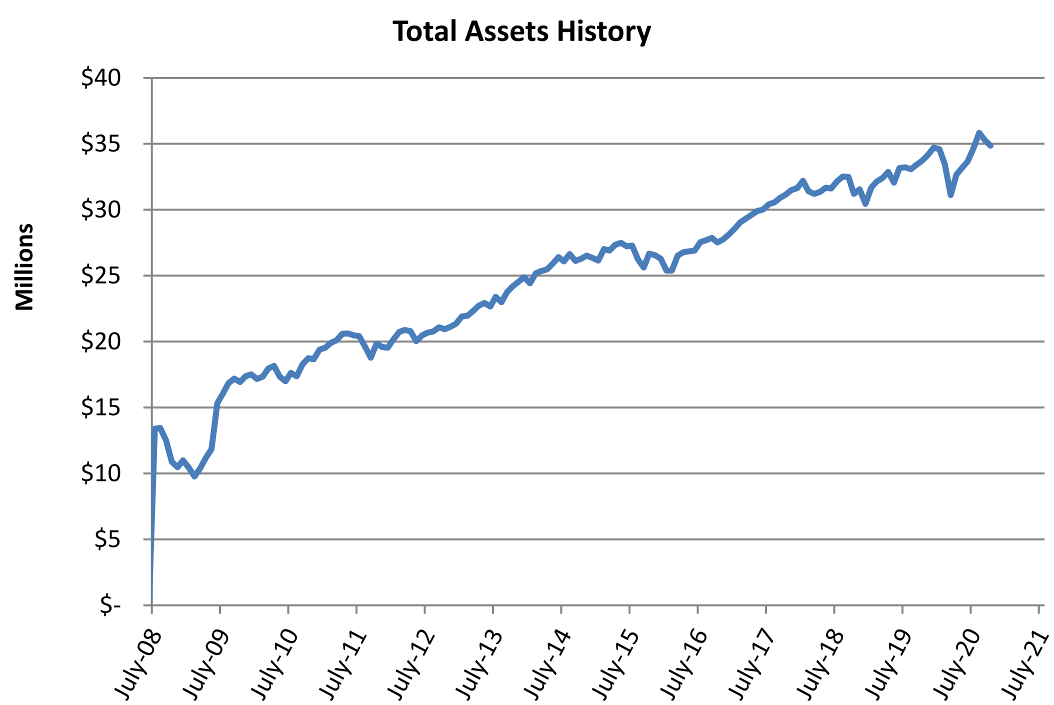


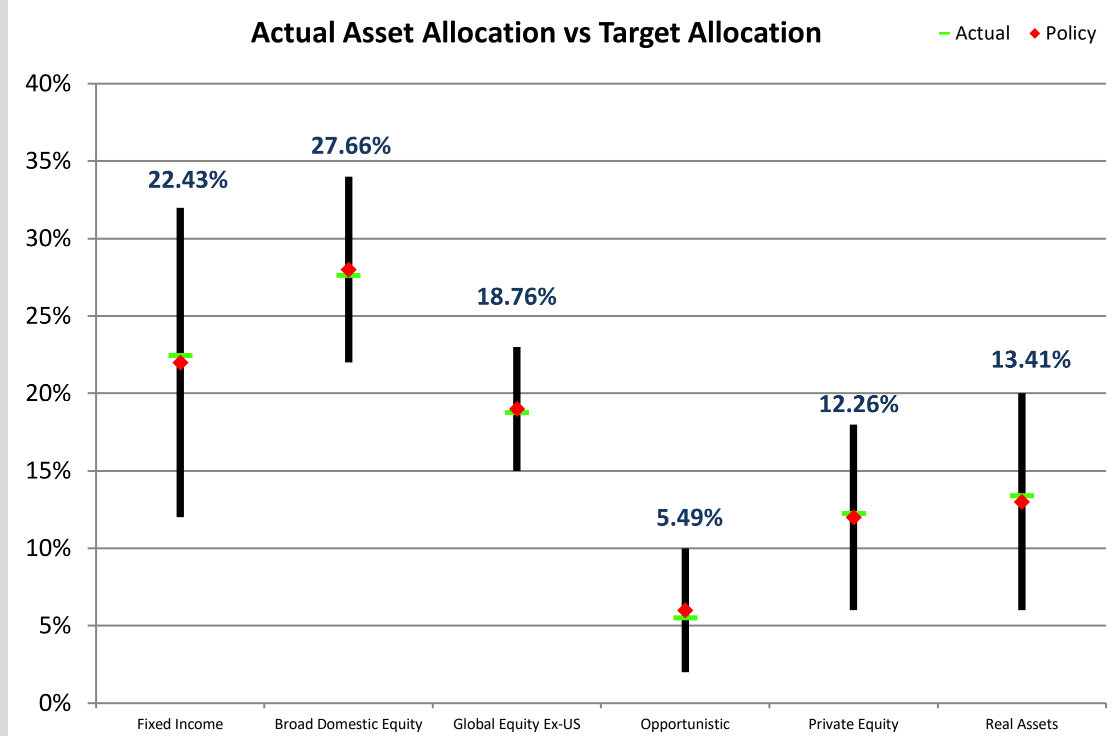
Judicial Retirement Health Care Trust Fund

Fiscal Year-to-Date through October 31, 2020



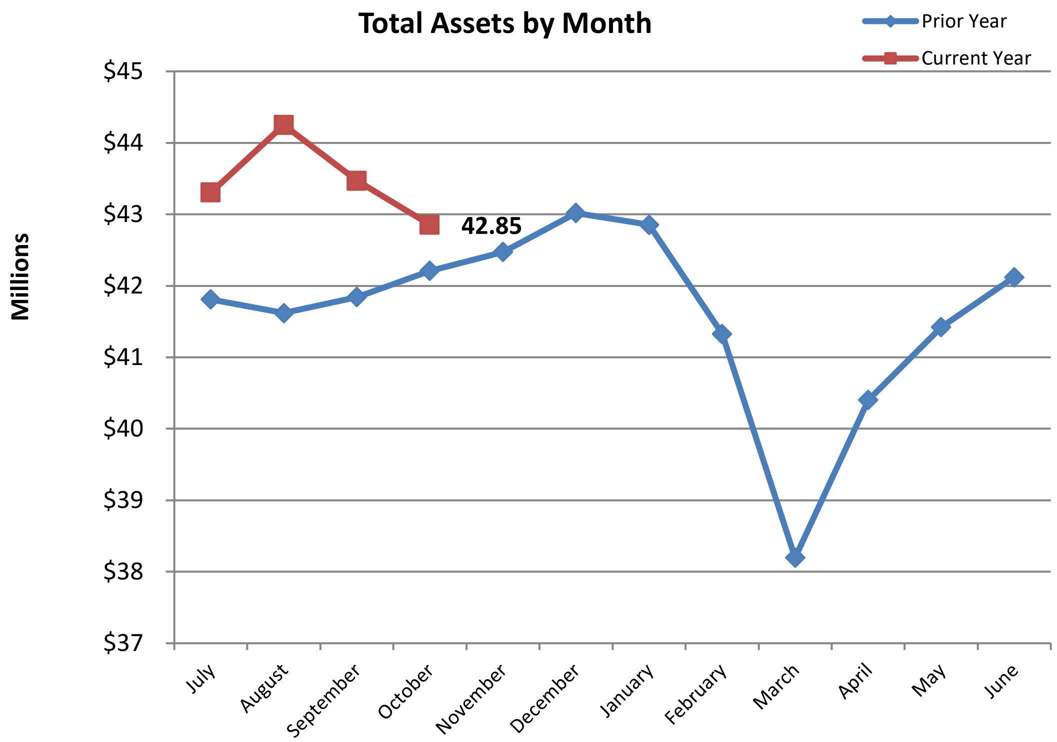


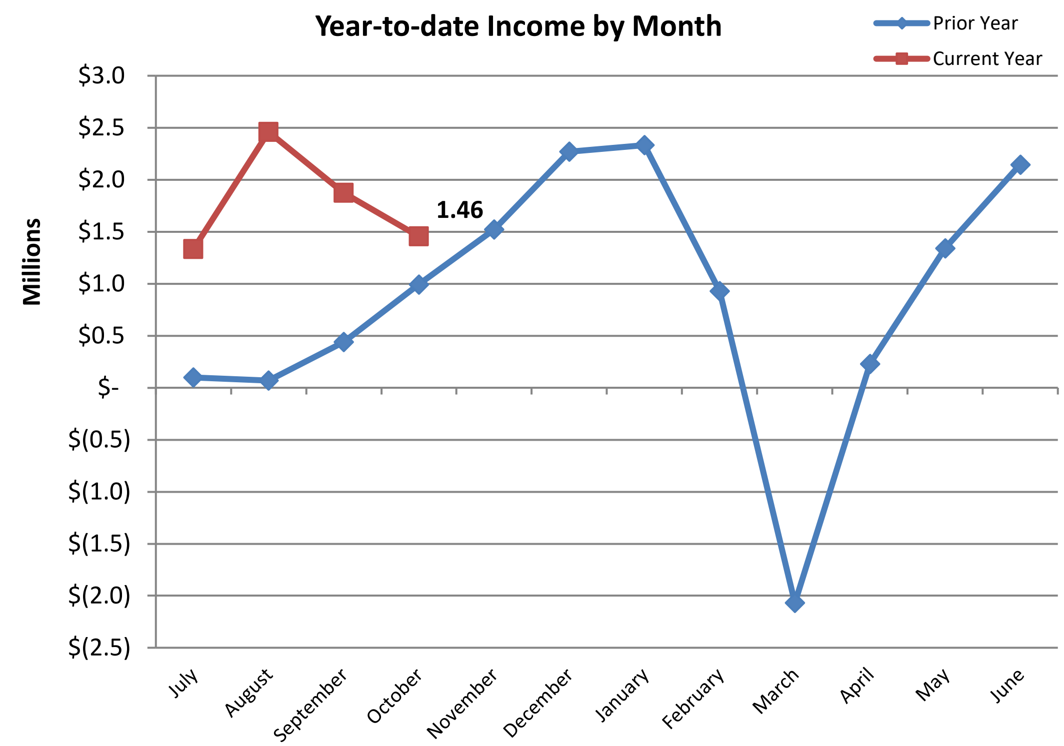


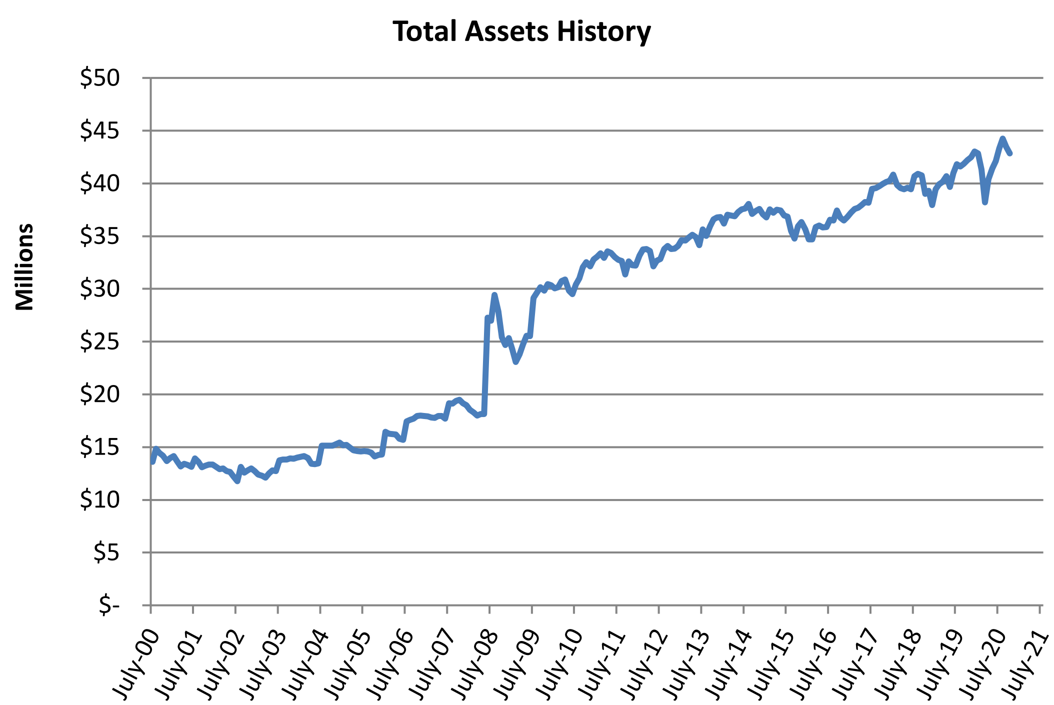


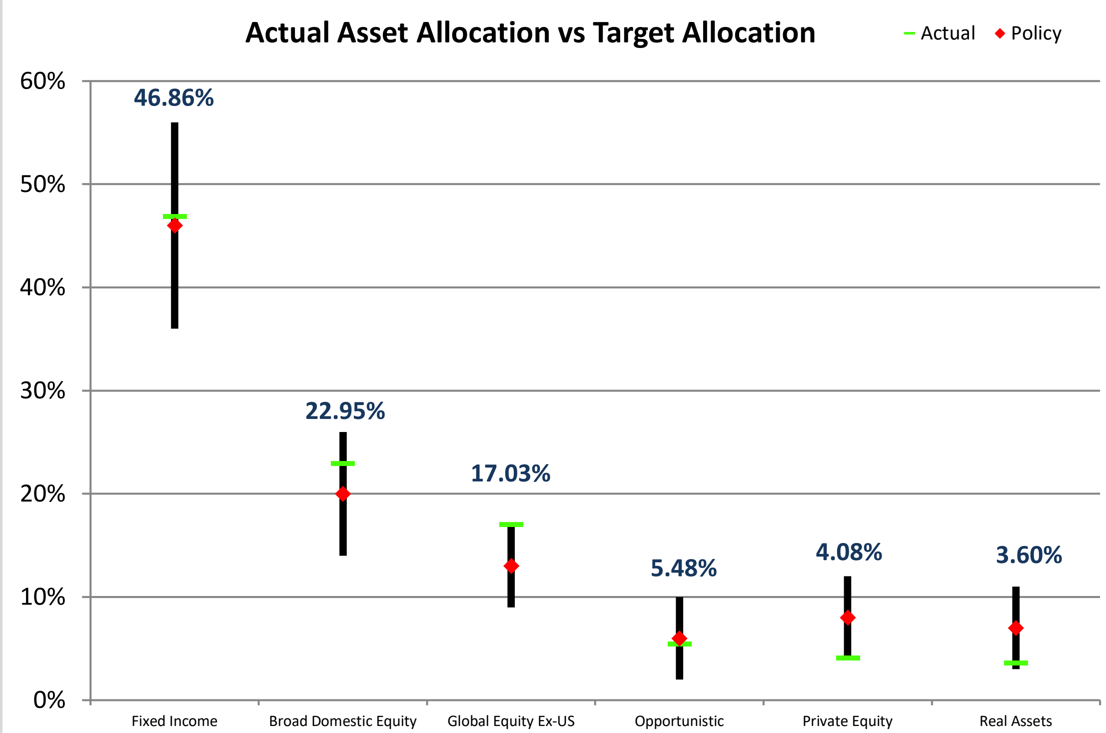
Military Retirement Trust Fund

Fiscal Year-to-Date through October 31, 2020









ALASKA RETIREMENT MANAGEMENT BOARD

Reporting of Funds by Manager

All Non-Participant Directed Plans

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended October 31, 2020

	Beginning Invested Assets	Investment Income	Net Contributions and (Withdrawals)	Ending Invested Assets	% increase (decrease)	% Change due to Investment Income
Cash						
Short-Term Fixed Income Pool	$ 302,350,845	$ 44,468	$ (9,108,264)	$ 293,287,049	-3.00%	0.01%
Securities Lending Income Pool	61,926	54,325	(61,292)	54,959	-11.25%	173.67%
Total Cash	302,412,771	98,793	(9,169,556)	293,342,008	-3.00%	0.03%
Fixed Income						
Alternative Fixed Income						
Crestline Investors, Inc.	593,749,772	3,069,259	1,501,249	598,320,280	0.77%	0.52%
Prisma Capital Partners	101,304,129	171,053	(9,000,000)	92,475,182	-8.72%	0.18%
Crestline Specialty Fund	28,533,038	-	(9,245,638)	19,287,400	-32.40%	-
Crestline Specialty Lending Fund II	36,884,429	-	(908,840)	35,975,589	-2.46%	-
Total Alternative Fixed Income	760,471,368	3,240,312	(17,653,229)	746,058,451	-1.90%	0.43%
Opportunistic Fixed Income						
Fidelity Inst. Asset Mgmt. High Yield CMBS	195,212,352	723,953	-	195,936,305	0.37%	0.37%
Fidelity Institutional Asset Management	703,745,097	(1,102,392)	-	702,642,705	-0.16%	-0.16%
MacKay Shields, LLC	5,262,677	16,343	-	5,279,020	0.31%	0.31%
Total Opportunistic Fixed Income	904,220,126	(362,096)	-	903,858,030	-0.04%	-0.04%
ARMB Barclays Agg Bond Fund	4,031,770,664	(19,634,187)	262,000,000	4,274,136,477	6.01%	-0.47%
Total Fixed Income	5,696,462,158	(16,755,971)	244,346,771	5,924,052,958	4.00%	-0.29%
Domestic Equities						
Small Cap						
Passively Managed						
ARMB S&P 600	625,841,366	16,697,929	(20,000,000)	622,539,295	-0.53%	2.71%
Total Passive	625,841,366	16,697,929	(20,000,000)	622,539,295	-0.53%	2.71%
Actively Managed						
Transition Account	-	-	-	-	-	-
Total Active	-	-	-	-	-	-
Total Small Cap	625,841,366	16,697,929	(20,000,000)	622,539,295	-0.53%	2.71%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended October 31, 2020

Large Cap						
Passively Managed						
ARMB S&P 900	5,197,555,586	(118,571,512)	(194,000,000)	4,884,984,074	-6.01%	-2.32%
Total Passive	5,197,555,586	(118,571,512)	(194,000,000)	4,884,984,074	-6.01%	-2.32%
Actively Managed						
ARMB Domestic Residual Assets	5,741	181	-	5,922	3.15%	3.15%
ARMB Large Cap Multi-Factor	117,879,031	(2,664,499)	-	115,214,532	-2.26%	-2.26%
ARMB Scientific Beta	2,149,265,218	(36,388,997)	(114,000,000)	1,998,876,221	-7.00%	-1.74%
Transition Account	-	423	-	423	-	-
Total Active	2,267,149,990	(39,052,892)	(114,000,000)	2,114,097,098	-6.75%	-1.77%
Total Large Cap	7,464,705,576	(157,624,404)	(308,000,000)	6,999,081,172	-6.24%	-2.16%
Total Domestic Equity	8,090,546,942	(140,926,475)	(328,000,000)	7,621,620,467	-5.80%	-1.78%
Large Cap						
Arrow Street Capital	545,835,491	(15,275,587)	(15,000,000)	515,559,904	-5.55%	-2.84%
Baillie Gifford Overseas Limited	284,287,124	(2,086,446)	(13,692,303)	268,508,375	-5.55%	-0.75%
Brandes Investment Partners	269,587,026	(11,228,195)	228,391	258,587,222	-4.08%	-4.16%
Cap Guardian Trust Co	557,735,279	(18,380,889)	(25,000,000)	514,354,390	-7.78%	-3.37%
Legal & General	822,448,558	(27,471,400)	(21,939,031)	773,038,127	-6.01%	-3.39%
McKinley Capital Management	3,365,510	169,502	(323)	3,534,689	5.03%	5.04%
SSgA MSCI World Ex-US IMI Index Fund	1,994,484,534	(75,688,468)	(10,000,000)	1,908,796,066	-4.30%	-3.80%
State Street Global Advisors	201,600	(323)	323	201,600	-	-0.16%
Total Large Cap	4,477,945,122	(149,961,806)	(85,402,943)	4,242,580,373	-5.26%	-3.38%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended October 31, 2020

Emerging Markets Equity						
MSCI Emerging Markets Index Fund	679,152,280	14,550,434	(36,000,000)	657,702,714	-3.16%	2.20%
DePrince, Race, and Zollo Emerging Markets	72,916	-	-	72,916	-	-
Legal & General Sci-Beta Emerging Markets	266,520,262	2,797,166	44,735	269,362,163	1.07%	1.05%
Total Emerging Markets	945,745,458	17,347,600	(35,955,265)	927,137,793	-1.97%	1.87%
Total Global Equities	5,423,690,580	(132,614,206)	(121,358,208)	5,169,718,166	-4.68%	-2.47%
Opportunistic						
Alternative Equity Strategy						
Alternative Equity Strategies Transition Account	-	-	-	-	-	-
McKinley Global Health Care	316,061,727	5,108,664	370,816	321,541,207	1.73%	1.62%
Total Alternative Equity Strategy	316,061,727	5,108,664	370,816	321,541,207	1.73%	1.62%
Alternative Beta						
Man Group Alternative Risk Premia	304,366,282	(11,307,755)	-	293,058,527	-3.72%	-3.72%
Total Alternative Beta	304,366,282	(11,307,755)	-	293,058,527	-3.72%	-3.72%
Other Opportunities						
Project Pearl	9,482,174	-	-	9,482,174	-	-
Schroders Insurance Linked Securities	21,413,261	266,813	(3,000,000)	18,680,074	-12.76%	1.34%
Total Other Opportunities	30,895,435	266,813	(3,000,000)	28,162,248	-8.85%	0.91%
Tactical Allocation Strategies						
Fidelity Signals	450,151,049	(7,121,371)	-	443,029,678	-1.58%	-1.58%
PineBridge	433,126,801	(5,048,306)	-	428,078,495	-1.17%	-1.17%
Total Tactical Allocation Strategies	883,277,850	(12,169,677)	-	871,108,173	-1.38%	-1.38%
Total Opportunistic	1,534,601,294	(18,101,955)	(2,629,184)	1,513,870,155	-1.35%	-1.18%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended October 31, 2020

Private Equity						
Abbott Capital	1,291,801,436	26,007,894	3,298,941	1,321,108,271	2.27%	2.01%
Advent International GPE Fund VIII-B	31,781,874	-	-	31,781,874	-	-
Advent International GPE Fund IX	11,779,740	-	-	11,779,740	-	-
Angelo, Gordon & Co.	5,698	-	-	5,698	-	-
Clearlake Capital Partners VI	4,084,298	-	-	4,084,298	-	-
Dyal Capital Partners III	27,999,559	-	(4,213,773)	23,785,786	-15.05%	-
Dyal Capital Partners IV	6,578,447	1	1,868,500	8,446,948	28.40%	0.00%
Glendon Opportunities	27,844,219	1	(2,700,793)	25,143,427	-9.70%	0.00%
Glendon Opportunities II	34,737,675	-	-	34,737,675	-	-
KKR Lending Partners II	15,842,646	-	-	15,842,646	-	-
Lexington Capital Partners VIII	30,992,491	-	(651,312)	30,341,179	-2.10%	-
Lexington Partners VII	14,086,581	5	(368,857)	13,717,729	-2.62%	0.00%
Merit Capital Partners	10,640,118	-	(1,039,111)	9,601,007	-9.77%	-
NB SOF III	15,855,386	-	-	15,855,386	-	-
NB SOF IV	24,574,868	-	-	24,574,868	-	-
New Mountain Partners IV	20,638,400	-	(1,170,517)	19,467,883	-5.67%	-
New Mountain Partners V	45,700,128	-	-	45,700,128	-	-
NGP XI	32,874,206	-	131,265	33,005,471	0.40%	-
NGP XII	17,488,763	-	823,521	18,312,284	4.71%	-
Onex Partnership III	6,190,970	-	-	6,190,970	-	-
Pathway Capital Management LLC	1,454,452,626	19,454,504	(3,238,711)	1,470,668,419	1.11%	1.34%
Resolute Fund III	16,991,658	-	14,142	17,005,800	0.08%	-
Resolute Fund IV	36,107,962	-	3,492,733	39,600,695	9.67%	-
Summit Partners GE IX	48,602,334	-	-	48,602,334	-	-
Summit Partners GE X	3,581,523	-	-	3,581,523	-	-
Warburg Pincus Global Growth Fund	11,429,710	-	1,440,000	12,869,710	12.60%	-
Warburg Pincus X	3,428,504	-	-	3,428,504	-	-
Warburg Pincus XI	16,000,614	-	(1,060,777)	14,939,837	-6.63%	-
Warburg Pincus XII	70,963,312	-	1,040,000	72,003,312	1.47%	-
Total Private Equity	3,333,055,746	45,462,405	(2,334,749)	3,376,183,402	1.29%	1.36%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended October 31, 2020

Real Assets						
Farmland						
Hancock Agricultural Investment Group	288,412,199	-	-	288,412,199	-	-
UBS Agrivest, LLC	577,207,935	-	-	577,207,935	-	-
Total Farmland	865,620,134	-	-	865,620,134	-	-
Timber						
Hancock Natural Resource Group	95,553,161	-	-	95,553,161	-	-
Timberland Invt Resource LLC	261,308,881	-	(1,600,000)	259,708,881	-0.61%	-
Total Timber	356,862,042	-	(1,600,000)	355,262,042	-0.45%	-
Energy						
EIG Energy Fund XIV-A	5,032,190	(429,197)	-	4,602,993	-8.53%	-8.53%
EIG Energy Fund XV	9,528,783	(150,787)	-	9,377,996	-1.58%	-1.58%
EIG Energy Fund XVI	45,011,100	881,743	-	45,892,843	1.96%	1.96%
Total Energy	59,572,073	301,759	-	59,873,832	0.51%	0.51%
REIT						
REIT Transition Account	-	-	-	-	-	-
ARMB REIT	304,563,562	(10,236,857)	-	294,326,705	-3.36%	-3.36%
Total REIT	304,563,562	(10,236,857)	-	294,326,705	-3.36%	-3.36%
Infrastructure Private						
IFM Global Infrastructure Fund-Private	537,230,711	9,527,995	-	546,758,706	1.77%	1.77%
JP Morgan Infrastructure Fund-Private	128,628,078	-	-	128,628,078	-	-
Total Infrastructure Private	665,858,789	9,527,995	-	675,386,784	1.43%	1.43%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended October 31, 2020

Real Estate						
Core Commingled Accounts						
BlackRock US Core Property Fund	224,499,298	1,276,457	100,000,000	325,775,755	45.11%	0.47%
JP Morgan	174,670,577	(306,678)	(2,555,766)	171,808,133	-1.64%	-0.18%
UBS Trumbull Property Fund	48,320,935	(190,887)	(454,746)	47,675,302	-1.34%	-0.40%
Total Core Commingled	447,490,810	778,892	96,989,488	545,259,190	21.85%	0.16%
Core Separate Accounts						
UBS Realty	505,823	-	-	505,823	-	-
Sentinel Separate Account	171,371,367	-	(712,235)	170,659,132	-0.42%	-
UBS Realty	626,422,091	-	824,343	627,246,434	0.13%	-
Total Core Separate	798,299,281	-	112,108	798,411,389	0.01%	-
Non-Core Commingled Accounts						
Almanac Realty Securities V	79,536	-	-	79,536	-	-
Almanac Realty Securities VII	24,028,048	-	264,699	24,292,747	1.10%	-
Almanac Realty Securities VIII	6,911,879	-	1,311,470	8,223,349	18.97%	-
Clarion Ventures 4	34,799,180	-	-	34,799,180	-	-
Colony Investors VIII, L.P.	1,191,591	-	-	1,191,591	-	-
Coventry	269,749	-	-	269,749	-	-
ING Clarion Development Ventures III	1,262,283	-	-	1,262,283	-	-
KKR Real Estate Partners Americas II	14,987,550	-	-	14,987,550	-	-
KKR Real Estate Partners Americas L.P.	6,502,276	-	-	6,502,276	-	-
Silverpeak Legacy Pension Partners II, L.P.	1,169,611	-	-	1,169,611	-	-
Silverpeak Legacy Pension Partners III, L.P.	2,758,588	-	-	2,758,588	-	-
Tishman Speyer Real Estate Venture VI	1,977,531	-	-	1,977,531	-	-
Tishman Speyer Real Estate Venture VII	455,310	-	-	455,310	-	-
Total Non-Core Commingled	96,393,132	-	1,576,169	97,969,301	1.64%	-
Total Real Estate	1,342,183,223	778,892	98,677,765	1,441,639,880	7.41%	0.06%
Total Real Assets	3,594,659,823	371,789	97,077,765	3,692,109,377	2.71%	0.01%
Total Assets	$ 27,975,429,314	$ (262,465,620)	$ (122,067,161)	$ 27,590,896,533	-1.37%	-0.94%

ALASKA RETIREMENT MANAGEMENT BOARD

Reporting of Funds by Manager

Participant Directed Plans

Supplemental Annuity Plan
Schedule of Investment Income and Changes in Invested Assets
for the Month Ended
October 31, 2020

Participant Options	Beginning Invested Assets	Investment Income	Net Contributions (Withdrawals)	Transfers In (Out)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (1)
T. Rowe Price							
Stable Value Fund	$ 475,886,061	$ 683,934	$ (5,269,267)	$ 11,483,461	$ 482,784,189	1.45%	0.14%
Small Cap Stock Fund	203,458,614	8,007,226	(745,930)	(5,150,931)	205,568,979	1.04%	3.99%
Alaska Balanced Trust	1,117,738,117	(8,978,870)	(5,589,810)	4,674,047	1,107,843,484	-0.89%	-0.80%
Long Term Balanced Fund	688,770,520	(8,487,253)	(1,003,206)	(3,099,353)	676,180,708	-1.83%	-1.24%
AK Target Date 2010 Trust	11,457,037	(95,807)	(350,330)	63,033	11,073,933	-3.34%	-0.85%
AK Target Date 2015 Trust	79,607,703	(721,875)	(1,278,130)	(1,075,484)	76,532,214	-3.86%	-0.92%
AK Target Date 2020 Trust	88,055,650	(976,095)	(305,094)	(716,127)	86,058,334	-2.27%	-1.11%
AK Target Date 2025 Trust	98,749,216	(1,264,720)	(132,881)	(622,995)	96,728,620	-2.05%	-1.29%
AK Target Date 2030 Trust	73,720,500	(1,057,691)	313,894	(577,145)	72,399,558	-1.79%	-1.44%
AK Target Date 2035 Trust	72,812,639	(1,153,438)	461,089	(300,239)	71,820,051	-1.36%	-1.58%
AK Target Date 2040 Trust	73,662,030	(1,236,223)	479,069	(520,082)	72,384,794	-1.73%	-1.68%
AK Target Date 2045 Trust	84,858,004	(1,509,308)	484,970	(540,502)	83,293,164	-1.84%	-1.78%
AK Target Date 2050 Trust	93,684,392	(1,676,481)	668,784	(290,385)	92,386,310	-1.39%	-1.79%
AK Target Date 2055 Trust	93,498,429	(1,665,551)	835,955	(413,669)	92,255,164	-1.33%	-1.78%
AK Target Date 2060 Trust	3,684,832	(69,132)	177,707	(80,832)	3,712,575	0.75%	-1.85%
AK Target Date 2065 Trust	708,059	(16,486)	67,368	118,479	877,420	23.92%	-2.06%
Total Investments with T. Rowe Price	3,260,351,803	(20,217,770)	(11,185,812)	2,951,276	3,231,899,497		
State Street Global Advisors							
Money Market	76,289,969	1,173	(1,263,403)	5,159,836	80,187,575	5.11%	0.00%
S&P 500 Stock Index Fund Series A	439,673,560	(11,210,592)	(1,610,141)	(10,940,139)	415,912,688	-5.40%	-2.59%
Russell 3000 Index	124,372,369	(2,665,564)	(363,622)	435,622	121,778,805	-2.09%	-2.14%
World Equity Ex-US Index	58,637,699	(1,378,074)	(102,734)	2,224,920	59,381,811	1.27%	-2.31%
Total Investments with SSgA	698,973,597	(15,253,057)	(3,339,900)	(3,119,761)	677,260,879		
BlackRock							
Passive U.S. Bond Index Fund	203,700,938	(906,810)	(1,380,314)	3,084,932	204,498,746	0.39%	-0.44%
Strategic Completion Fund	33,080,747	(451,940)	(28,036)	(782,667)	31,818,104	-3.82%	-1.38%
Total Investments with BlackRock	236,781,685	(1,358,750)	(1,408,350)	2,302,265	236,316,850		
Brandes/Baillie Gifford (2)							
AK International Equity Fund	88,510,936	(2,185,162)	(106,021)	(306,228)	85,913,525	-2.93%	-2.47%
Northern Trust							
Environmental, Social, and Governance Fund	115,825,470	(3,085,737)	(195,909)	(1,827,552)	110,716,272	-4.41%	-2.69%
Total All Funds	$ 4,400,443,491	$ (42,100,476)	$ (16,235,992)	$ -	$ 4,342,107,023	-1.33%	-0.96%

Notes: Source data provided by the record keeper, Empower Retirement.

(1) Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates.

(2) This investment is comprised of two funds, Brandes International Equity Fund and Baillie Gifford International Equity Fund.

Supplemental Annuity Plan
Schedule of Invested Assets with
Schedule of Investment Income and Changes in Invested Assets
By Month Through the Month Ended
October 31, 2020
$ (Thousands)

Invested Assets (at fair value)	**July**	**August**	**September**	**October**
Investments with T. Rowe Price				
Stable Value Fund	$ 465,771	$ 470,483	$ 475,886	$ 482,784
Small Cap Stock Fund	202,262	210,954	203,459	205,569
Alaska Balanced Trust	1,116,968	1,131,790	1,117,738	1,107,843
Long Term Balanced Fund	681,497	700,604	688,771	676,181
AK Target Date 2010 Trust	11,197	11,541	11,457	11,074
AK Target Date 2015 Trust	79,289	80,979	79,608	76,532
AK Target Date 2020 Trust	89,384	91,060	88,056	86,058
AK Target Date 2025 Trust	96,924	101,280	98,749	96,729
AK Target Date 2030 Trust	72,048	74,896	73,721	72,400
AK Target Date 2035 Trust	70,541	74,596	72,813	71,820
AK Target Date 2040 Trust	72,115	76,031	73,662	72,385
AK Target Date 2045 Trust	81,618	87,042	84,858	83,293
AK Target Date 2050 Trust	90,760	96,238	93,684	92,386
AK Target Date 2055 Trust	89,572	95,384	93,498	92,255
AK Target Date 2060 Trust	3,289	3,633	3,685	3,713
AK Target Date 2065 Trust	642	778	708	877
State Street Global Advisors				
Money Market	71,394	73,758	76,290	80,188
S&P 500 Stock Index Fund Series A	436,717	462,900	439,674	415,913
Russell 3000 Index	125,246	129,139	124,372	121,779
World Equity Ex-US Index	58,383	57,546	58,638	59,382
Investments with BlackRock				
Passive U.S. Bond Index Fund	203,034	205,613	203,701	204,499
Strategic Completion Fund	33,792	33,816	33,081	31,818
Investments with Brandes/Baillie Gifford				
AK International Equity Fund	83,511	90,728	88,511	85,914
Investments with Northern Trust				
Environmental, Social, and Governance Fund	112,784	122,897	115,825	110,716
Total Invested Assets	**$ 4,348,738**	**$ 4,483,686**	**$ 4,400,443**	**$ 4,342,107**

Change in Invested Assets	**July**	**August**	**September**	**October**
Beginning Assets	$ 4,226,458	$ 4,348,738	$ 4,483,686	$ 4,400,443
Investment Earnings	132,677	149,038	(77,761)	(42,100)
Net Contributions (Withdrawals)	(10,397)	(14,090)	(5,482)	(16,236)
Ending Invested Assets	**$ 4,348,738**	**$ 4,483,686**	**$ 4,400,443**	**$ 4,342,107**

Source data provided by the record keeper, Empower Retirement.

Deferred Compensation Plan
Schedule of Invested Assets and Changes in Invested Assets
for the Month Ended
October 31, 2020

Participant Options	Beginning Invested Assets	Investment Income	Net Contributions (Withdrawals)	Transfers In (Out)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (1)
T. Rowe Price							
Stable Value Fund	$ 209,047,557	$ 298,253	$ (1,156,096)	$ 1,794,744	$ 209,984,458	0.45%	0.14%
Small Cap Stock Fund	114,901,020	4,505,714	(430,277)	(1,849,339)	117,127,118	1.94%	3.96%
Alaska Balanced Trust	28,946,206	(257,561)	(368,991)	1,922,698	30,242,352	4.48%	-0.87%
Long Term Balanced Fund	82,030,757	(1,042,632)	(7,441)	1,101,113	82,081,797	0.06%	-1.26%
AK Target Date 2010 Trust	3,452,608	(26,106)	(100,607)	26,027	3,351,922	-2.92%	-0.76%
AK Target Date 2015 Trust	10,040,982	(93,551)	(102,254)	(1,256)	9,843,921	-1.96%	-0.94%
AK Target Date 2020 Trust	23,216,032	(247,595)	(539,231)	(209,522)	22,219,684	-4.29%	-1.08%
AK Target Date 2025 Trust	24,131,556	(322,592)	71,984	201,779	24,082,727	-0.20%	-1.33%
AK Target Date 2030 Trust	14,115,298	(205,602)	41,346	(26,223)	13,924,819	-1.35%	-1.46%
AK Target Date 2035 Trust	9,649,471	(152,370)	127,527	(61,607)	9,563,021	-0.90%	-1.57%
AK Target Date 2040 Trust	10,169,345	(172,045)	92,638	(327,192)	9,762,746	-4.00%	-1.71%
AK Target Date 2045 Trust	7,642,267	(124,160)	69,642	(284,701)	7,303,048	-4.44%	-1.65%
AK Target Date 2050 Trust	5,418,490	(97,127)	81,897	(46,192)	5,357,068	-1.13%	-1.79%
AK Target Date 2055 Trust	5,199,516	(88,409)	25,502	(68,662)	5,067,947	-2.53%	-1.71%
AK Target Date 2060 Trust	939,190	(17,333)	10,915	7,124	939,896	0.08%	-1.83%
AK Target Date 2065 Trust	181,970	(2,803)	2,966	(20,999)	161,134	-11.45%	-1.62%
Total Investments with T. Rowe Price	549,082,265	1,954,081	(2,180,480)	2,157,792	551,013,658		
State Street Global Advisors							
Money Market	24,253,566	372	(164,115)	1,165,904	25,255,727	4.13%	0.00%
S&P 500 Stock Index	229,011,430	(6,020,805)	(294,149)	(1,865,594)	220,830,882	-3.57%	-2.64%
Russell 3000 Index	39,469,925	(806,217)	(18,179)	(809,079)	37,836,450	-4.14%	-2.06%
World Equity Ex-US Index	18,369,934	(428,967)	70,884	562,481	18,574,332	1.11%	-2.30%
Total Investments with SSgA	311,104,855	(7,255,617)	(405,559)	(946,288)	302,497,391		
BlackRock							
Passive U.S. Bond Index Fund	89,053,904	(392,888)	(107,573)	39,090	88,592,533	-0.52%	-0.44%
Strategic Completion Fund	14,640,942	(198,584)	(67,095)	(299,806)	14,075,457	-3.86%	-1.37%
Total Investments with BlackRock	103,694,846	(591,472)	(174,668)	(260,716)	102,667,990		
Brandes/Baillie Gifford (2)							
AK International Equity Fund	39,177,819	(962,588)	31,543	(198,375)	38,048,399	-2.88%	-2.46%
Northern Trust							
Environmental, Social, and Governance Fund	41,023,146	(1,089,045)	(42,363)	(752,413)	39,139,325	-4.59%	-2.68%
Total All Funds	$ 1,044,082,931	$ (7,944,641)	$ (2,771,527)	$ -	$ 1,033,366,763	-1.03%	-0.76%

Notes: Source data provided by the record keeper, Empower Retirement.

(1) Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates.

(2) This investment is comprised of two funds, Brandes International Equity Fund and Baillie Gifford International Equity Fund.

Deferred Compensation Plan
Schedule of Invested Assets with
Schedule of Investment Income and Changes in Invested Assets
By Month Through the Month Ended
October 31, 2020
$ (Thousands)

Invested Assets (at fair value)	July	August	September	October
Investments with T. Rowe Price				
Stable Value Fund	$ 205,336	$ 207,965	$ 209,048	$ 209,984
Small Cap Stock Fund	114,274	117,607	114,901	117,127
Alaska Balanced Trust	28,531	28,203	28,946	30,242
Long Term Balanced Fund	80,739	83,115	82,031	82,082
AK Target Date 2010 Trust	3,405	3,498	3,453	3,352
AK Target Date 2015 Trust	9,902	10,202	10,041	9,844
AK Target Date 2020 Trust	23,102	23,815	23,216	22,220
AK Target Date 2025 Trust	23,997	25,472	24,132	24,083
AK Target Date 2030 Trust	13,690	14,287	14,115	13,925
AK Target Date 2035 Trust	9,250	9,860	9,649	9,563
AK Target Date 2040 Trust	9,767	10,415	10,169	9,763
AK Target Date 2045 Trust	7,338	7,760	7,642	7,303
AK Target Date 2050 Trust	5,155	5,469	5,418	5,357
AK Target Date 2055 Trust	4,906	5,299	5,200	5,068
AK Target Date 2060 Trust	890	955	939	940
AK Target Date 2065 Trust	181	183	182	161
State Street Global Advisors				
Money Market	23,303	23,948	24,254	25,256
S&P 500 Stock Index	224,966	239,819	229,011	220,831
Russell 3000 Index	38,995	41,650	39,470	37,836
World Equity Ex-US Index	17,976	18,012	18,370	18,574
Investments with BlackRock				
Passive U.S. Bond Index Fund	89,300	89,452	89,054	88,593
Strategic Completion Fund	14,840	14,892	14,641	14,075
Investments with Brandes/Baillie Gifford				
AK International Equity Fund	37,777	40,072	39,178	38,048
Investments with Northern Trust				
Environmental, Social, and Governance Fund	40,738	43,478	41,023	39,139
Total Invested Assets	**$ 1,028,357**	**$ 1,065,430**	**$ 1,044,083**	**$ 1,033,367**
Change in Invested Assets				
Beginning Assets	$ 998,966	$ 1,028,357	$ 1,065,430	$ 1,044,083
Investment Earnings	32,812	38,421	(19,581)	(7,945)
Net Contributions (Withdrawals)	(3,421)	(1,348)	(1,767)	(2,772)
Ending Invested Assets	**$ 1,028,357**	**$ 1,065,430**	**$ 1,044,083**	**$ 1,033,367**

Source data provided by the record keeper, Empower Retirement.

Defined Contribution Retirement - Participant Directed PERS
Schedule of Investment Income and Changes in Invested Assets
for the Month Ended
October 31, 2020

Participant Options	Beginning Invested Assets	Investment Income	Net Contributions (Withdrawals)	Transfers In (Out)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (1)
T. Rowe Price							
Stable Value Fund	$ 87,494,208	$ 127,347	$ (26,663)	$ 3,784,329	$ 91,379,221	4.44%	0.14%
Small Cap Stock Fund	94,741,748	3,746,955	297,655	(3,542,270)	95,244,088	0.53%	4.02%
Alaska Balanced Trust	9,886,309	(153,307)	62,622	4,663,539	14,459,163	46.25%	-1.25%
Long Term Balanced Fund	9,539,580	(200,568)	16,132	3,171,222	12,526,366	31.31%	-1.80%
AK Target Date 2010 Trust	3,200,511	(27,314)	(16,622)	19,860	3,176,435	-0.75%	-0.85%
AK Target Date 2015 Trust	12,239,741	(115,551)	(32,627)	(60,535)	12,031,028	-1.71%	-0.95%
AK Target Date 2020 Trust	40,208,225	(459,585)	173,955	30,623	39,953,218	-0.63%	-1.14%
AK Target Date 2025 Trust	70,370,412	(919,788)	544,736	(261,487)	69,733,873	-0.90%	-1.30%
AK Target Date 2030 Trust	75,419,348	(1,098,182)	547,990	(345,273)	74,523,883	-1.19%	-1.45%
AK Target Date 2035 Trust	93,428,644	(1,491,950)	729,018	(187,716)	92,477,996	-1.02%	-1.59%
AK Target Date 2040 Trust	108,928,856	(1,857,269)	1,159,258	(714,507)	107,516,338	-1.30%	-1.70%
AK Target Date 2045 Trust	140,644,808	(2,521,808)	1,157,729	(925,633)	138,355,096	-1.63%	-1.79%
AK Target Date 2050 Trust	167,334,042	(3,030,611)	1,515,084	(112,370)	165,706,145	-0.97%	-1.80%
AK Target Date 2055 Trust	170,670,292	(3,121,199)	2,489,701	(234,549)	169,804,245	-0.51%	-1.82%
AK Target Date 2060 Trust	2,657,789	(55,380)	278,759	(73,550)	2,807,618	5.64%	-2.01%
AK Target Date 2065 Trust	800,571	(22,300)	95,713	72,989	946,973	18.29%	-2.52%
Total Investments with T. Rowe Price	1,087,565,084	(11,200,510)	8,992,440	5,284,672	1,090,641,686		
State Street Global Advisors							
Money Market	17,810,369	294	28,989	3,490,055	21,329,707	19.76%	0.00%
S&P 500 Stock Index Fund Series A	64,968,744	(1,517,591)	298,888	(5,183,835)	58,566,206	-9.85%	-2.43%
Russell 3000 Index	75,585,283	(1,524,684)	282,377	(1,990,598)	72,352,378	-4.28%	-2.04%
World Equity Ex-US Index	52,890,480	(1,254,263)	210,541	2,037,113	53,883,871	1.88%	-2.32%
Total Investments with SSgA	211,254,876	(4,296,244)	820,795	(1,647,265)	206,132,162		
BlackRock							
Passive U.S. Bond Index Fund	88,982,729	(388,818)	154,088	(1,999,942)	86,748,057	-2.51%	-0.44%
Strategic Completion Fund	4,100,594	(56,908)	30,996	(98,177)	3,976,505	-3.03%	-1.40%
Total Investments with BlackRock	93,083,323	(445,726)	185,084	(2,098,119)	90,724,562		
Brandes/Baillie Gifford (2)							
AK International Equity Fund	63,518,274	(1,544,407)	218,923	(911,315)	61,281,475	-3.52%	-2.44%
Northern Trust							
Environmental, Social, and Governance Fund	55,815,604	(1,507,668)	137,352	(627,973)	53,817,315	-3.58%	-2.71%
Total All Funds	$ 1,511,237,161	$ (18,994,555)	$ 10,354,594	$ -	$ 1,502,597,200	-0.57%	-1.25%

Notes: Source data provided by the record keeper, Empower Retirement.
(1) Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates.
(2) This investment is comprised of two funds, Brandes International Equity Fund and Baillie Gifford International Equity Fund.

Defined Contribution Retirement - Participant Directed PERS
Schedule of Invested Assets with
Schedule of Investment Income and Changes in Invested Assets
By Month Through the Month Ended
October 31, 2020
$ (Thousands)

Invested Assets (at fair value)	**July**	**August**	**September**	**October**
Investments with T. Rowe Price				
Stable Value Fund	$ 80,056	$ 83,080	$ 87,494	$ 91,379
Small Cap Stock Fund	95,973	98,531	94,742	95,244
Alaska Balanced Trust	6,172	5,193	9,886	14,459
Long Term Balanced Fund	6,440	6,699	9,540	12,526
AK Target Date 2010 Trust	3,080	3,170	3,201	3,176
AK Target Date 2015 Trust	12,097	12,415	12,240	12,031
AK Target Date 2020 Trust	39,535	40,661	40,208	39,953
AK Target Date 2025 Trust	68,499	71,793	70,370	69,734
AK Target Date 2030 Trust	73,322	76,603	75,419	74,524
AK Target Date 2035 Trust	90,031	95,192	93,429	92,478
AK Target Date 2040 Trust	105,521	111,723	108,929	107,516
AK Target Date 2045 Trust	135,169	143,639	140,645	138,355
AK Target Date 2050 Trust	161,065	171,252	167,334	165,706
AK Target Date 2055 Trust	162,577	173,757	170,670	169,804
AK Target Date 2060 Trust	2,275	2,534	2,658	2,808
AK Target Date 2065 Trust	653	755	801	947
State Street Global Advisors				
Money Market	13,567	14,358	17,810	21,330
S&P 500 Stock Index Fund Series A	64,044	72,147	64,969	58,566
Russell 3000 Index	76,824	80,528	75,585	72,352
World Equity Ex-US Index	54,283	52,501	52,890	53,884
Investments with BlackRock				
Passive U.S. Bond Index Fund	89,420	91,328	88,983	86,748
Strategic Completion Fund	4,134	4,178	4,101	3,977
Investments with Brandes/Baillie Gifford				
AK International Equity Fund	60,432	65,756	63,518	61,281
Investments with Northern Trust				
Environmental, Social, and Governance Fund	54,747	58,637	55,816	53,817
Total Invested Assets	**$ 1,459,912**	**$ 1,536,430**	**$ 1,511,237**	**$ 1,502,597**
Change in Invested Assets				
Beginning Assets	$ 1,394,890	$ 1,459,912	$ 1,536,430	$ 1,511,237
Investment Earnings	57,470	68,222	(35,705)	(18,995)
Net Contributions (Withdrawals)	7,552	8,296	10,512	10,355
Ending Invested Assets	**$ 1,459,912**	**$ 1,536,430**	**$ 1,511,237**	**$ 1,502,597**

Source data provided by the record keeper, Empower Retirement.

Defined Contribution Retirement - Participant Directed TRS
Schedule of Investment Income and Changes in Invested Assets
for the Month Ended
October 31, 2020

Participant Options	Beginning Invested Assets	Investment Income	Net Contributions (Withdrawals)	Transfers In (Out)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (1)
T. Rowe Price							
Stable Value Fund	$ 33,818,620	$ 49,069	$ 2,955	$ 1,555,538	$ 35,426,182	4.75%	0.14%
Small Cap Stock Fund	39,238,841	1,558,512	65,858	(1,509,764)	39,353,447	0.29%	4.05%
Alaska Balanced Trust	2,902,922	(57,092)	3,755	2,139,722	4,989,307	71.87%	-1.44%
Long Term Balanced Fund	3,801,564	(79,890)	10,939	1,229,675	4,962,288	30.53%	-1.81%
AK Target Date 2010 Trust	1,042,564	(9,150)	7,322	-	1,040,736	-0.18%	-0.87%
AK Target Date 2015 Trust	3,782,294	(33,846)	(141,195)	-	3,607,253	-4.63%	-0.91%
AK Target Date 2020 Trust	11,993,115	(138,204)	107,507	-	11,962,418	-0.26%	-1.15%
AK Target Date 2025 Trust	21,970,663	(287,228)	(12,006)	213	21,671,642	-1.36%	-1.31%
AK Target Date 2030 Trust	28,201,197	(415,455)	294,482	(39,770)	28,040,454	-0.57%	-1.47%
AK Target Date 2035 Trust	40,010,593	(638,136)	374,016	(137,864)	39,608,609	-1.00%	-1.59%
AK Target Date 2040 Trust	45,537,535	(777,998)	430,518	(264,018)	44,926,037	-1.34%	-1.71%
AK Target Date 2045 Trust	66,265,021	(1,197,423)	500,502	(106,865)	65,461,235	-1.21%	-1.80%
AK Target Date 2050 Trust	93,618,066	(1,688,000)	784,657	(81,399)	92,633,324	-1.05%	-1.80%
AK Target Date 2055 Trust	57,167,367	(1,042,926)	833,015	(74,997)	56,882,459	-0.50%	-1.81%
AK Target Date 2060 Trust	695,293	(16,523)	121,665	-	800,435	15.12%	-2.19%
AK Target Date 2065 Trust	74,420	(1,835)	13,262	-	85,847	15.35%	-2.26%
Total Investments with T. Rowe Price	450,120,075	(4,776,125)	3,397,252	2,710,471	451,451,673		
State Street Global Advisors							
Money Market	5,778,957	96	11,447	1,264,210	7,054,710	22.08%	0.00%
S&P 500 Stock Index Fund Series A	20,867,598	(464,783)	45,537	(2,305,243)	18,143,109	-13.06%	-2.35%
Russell 3000 Index	31,977,784	(650,064)	75,377	(709,207)	30,693,890	-4.01%	-2.05%
World Equity Ex-US Index	23,079,978	(541,863)	52,387	780,019	23,370,521	1.26%	-2.31%
Total Investments with SSgA	81,704,317	(1,656,614)	184,748	(970,221)	79,262,230		
BlackRock							
Passive U.S. Bond Index Fund	35,854,711	(155,697)	29,352	(1,059,640)	34,668,726	-3.31%	-0.44%
Strategic Completion Fund	1,267,191	(18,339)	12,511	(12,381)	1,248,982	-1.44%	-1.45%
Total Investments with BlackRock	37,121,902	(174,036)	41,863	(1,072,021)	35,917,708		
Brandes/Baillie Gifford (2)							
AK International Equity Fund	27,279,918	(659,073)	52,856.00	(419,181)	26,254,520	-3.76%	-2.43%
Northern Trust							
Environmental, Social, and Governance Fund	23,718,823	(635,306)	(16,023.00)	(249,048)	22,818,446	-3.80%	-2.69%
Total All Funds	$ 619,945,035	$ (7,901,154)	$ 3,660,696	$ -	$ 615,704,577	-0.68%	-1.27%

Notes: Source data provided by the record keeper, Empower Retirement.
(1) Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates.
(2) This investment is comprised of two funds, Brandes International Equity Fund and Baillie Gifford International Equity Fund.

Defined Contribution Retirement - Participant Directed TRS
Schedule of Invested Assets with
Schedule of Investment Income and Changes in Invested Assets
By Month Through the Month Ended
October 31, 2020
$ (Thousands)

Invested Assets (at fair value)	**July**	**August**	**September**	**October**
Investments with T. Rowe Price				
Stable Value Fund	$ 31,324	$ 33,005	$ 33,819	$ 35,426
Small Cap Stock Fund	40,640	41,198	39,239	39,353
Alaska Balanced Trust	1,456	974	2,903	4,989
Long Term Balanced Fund	2,518	2,580	3,802	4,962
AK Target Date 2010 Trust	1,027	1,054	1,043	1,041
AK Target Date 2015 Trust	3,973	3,818	3,782	3,607
AK Target Date 2020 Trust	12,133	12,377	11,993	11,962
AK Target Date 2025 Trust	21,903	22,699	21,971	21,672
AK Target Date 2030 Trust	27,943	28,909	28,201	28,040
AK Target Date 2035 Trust	39,332	40,946	40,011	39,609
AK Target Date 2040 Trust	44,653	46,518	45,538	44,926
AK Target Date 2045 Trust	64,726	68,216	66,265	65,461
AK Target Date 2050 Trust	91,622	96,600	93,618	92,633
AK Target Date 2055 Trust	55,732	58,638	57,167	56,882
AK Target Date 2060 Trust	642	679	695	800
AK Target Date 2065 Trust	67	71	74	86
State Street Global Advisors				
Money Market	4,593	4,324	5,779	7,055
S&P 500 Stock Index Fund Series A	20,914	23,623	20,868	18,143
Russell 3000 Index	32,959	34,043	31,978	30,694
World Equity Ex-US Index	24,234	23,131	23,080	23,371
Investments with BlackRock				
Passive U.S. Bond Index Fund	36,533	37,407	35,855	34,669
Strategic Completion Fund	1,345	1,444	1,267	1,249
Investments with Brandes/Baillie Gifford				
AK International Equity Fund	26,438	28,458	27,280	26,255
Investments with Northern Trust				
Environmental, Social, and Governance Fund	23,663	24,912	23,719	22,818
Total Invested Assets	**$ 610,370**	**$ 635,624**	**$ 619,945**	**$ 615,705**
Change in Invested Assets				
Beginning Assets	$ 581,114	$ 610,370	$ 635,624	$ 619,945
Investment Earnings	24,312	28,829	(14,972)	(7,901)
Net Contributions (Withdrawals)	4,944	(3,575)	(707)	3,661
Ending Invested Assets	**$ 610,370**	**$ 635,624**	**$ 619,945**	**$ 615,705**

Source data provided by the record keeper, Empower Retirement.

ALASKA RETIREMENT MANAGEMENT BOARD

FINANCIAL REPORT
(Supplement to the Treasury Division Report)

As of October 31, 2020

Prepared by the Division of Retirement & Benefits

ALASKA RETIREMENT MANAGEMENT BOARD
SCHEDULE OF NON-INVESTMENT CHANGES BY FUND
(Supplement to the Treasury Division Report)
For the Four Months Ending October 31, 2020

	Contributions				Expenditures				Net
	Contributions EE and ER	State of Alaska	Other	Total Contributions	Benefits	Refunds & Disbursements	Administrative & Investment	Total Expenditures	Contributions/ (Withdrawals)
Public Employees' Retirement System (PERS)									
Defined Benefit Plans:									
Retirement Pension Trust	$ 116,520,463	$ 203,585,000	$ 12,373	$ 320,117,836	$ (306,702,194)	$ (2,751,031)	$ (1,507,658)	$ (310,960,883)	$ 9,156,953
Retirement Health Care Trust	23,709,897	-	21,934,985	45,644,882	(147,339,857)	-	(8,645,759)	(155,985,616)	(110,340,734)
Total Defined Benefit Plans	140,230,360	203,585,000	21,947,358	365,762,718	(454,042,051)	(2,751,031)	(10,153,417)	(466,946,499)	(101,183,781)
Defined Contribution Plans:									
Participant Directed Retirement	57,553,191	-	-	57,553,191	-	(18,159,220)	(2,679,685)	(20,838,905)	36,714,286
Health Reimbursement Arrangement [(a)]	14,106,609	-	-	14,106,609	(82,116)	-	(39,790)	(121,906)	13,984,703
Retiree Medical Plan [(a)]	5,737,497	-	15,736	5,753,233	(201,962)	-	(31,461)	(233,423)	5,519,810
Occupational Death and Disability: [(a)]									
All Others	1,113,298	-	-	1,113,298	(36,295)	-	(5,452)	(41,747)	1,071,551
Peace Officers and Firefighters	470,115	-	-	470,115	(117,497)	-	(10,077)	(127,574)	342,541
Total Defined Contribution Plans	78,980,710	-	15,736	78,996,446	(437,870)	(18,159,220)	(2,766,465)	(21,363,555)	57,632,891
Total PERS	**219,211,070**	**203,585,000**	**21,963,094**	**444,759,164**	**(454,479,921)**	**(20,910,251)**	**(12,919,882)**	**(488,310,054)**	**(43,550,890)**
Teachers' Retirement System (TRS)									
Defined Benefit Plans:									
Retirement Pension Trust	15,518,970	134,976,000	9,833	150,504,803	(167,771,358)	(200,173)	(793,624)	(168,765,155)	(18,260,352)
Retirement Health Care Trust	5,274,344	-	7,445,324	12,719,668	(46,366,826)	-	(2,266,499)	(48,633,325)	(35,913,657)
Total Defined Benefit Plans	20,793,314	134,976,000	7,455,157	163,224,471	(214,138,184)	(200,173)	(3,060,123)	(217,398,480)	(54,174,009)
Defined Contribution Plans:									
Participant Directed Retirement	15,615,392	-	-	15,615,392	-	(10,378,736)	(913,777)	(11,292,513)	4,322,879
Health Reimbursement Arrangement [(a)]	3,246,989	-	-	3,246,989	(27,806)	-	(11,937)	(39,743)	3,207,246
Retiree Medical Plan [(a)]	1,077,140	-	864	1,078,004	(110,259)	-	(19,577)	(129,836)	948,168
Occupational Death and Disability [(a)]	82,938	-	-	82,938	(8,098)	-	(4,090)	(12,188)	70,750
Total Defined Contribution Plans	20,022,459	-	864	20,023,323	(146,163)	(10,378,736)	(949,381)	(11,474,280)	8,549,043
Total TRS	**40,815,773**	**134,976,000**	**7,456,021**	**183,247,794**	**(214,284,347)**	**(10,578,909)**	**(4,009,504)**	**(228,872,760)**	**(45,624,966)**
Judicial Retirement System (JRS)									
Defined Benefit Plan Retirement Pension Trust	2,470,192	5,145,000	-	7,615,192	(4,803,597)	-	(39,607)	(4,843,204)	2,771,988
Defined Benefit Retirement Health Care Trust	256,335	-	67,767	324,102	(616,536)	-	(22,240)	(638,776)	(314,674)
Total JRS	**2,726,527**	**5,145,000**	**67,767**	**7,939,294**	**(5,420,133)**	**-**	**(61,847)**	**(5,481,980)**	**2,457,314**
National Guard/Naval Militia Retirement System (NGNMRS)									
Defined Benefit Plan Retirement Pension Trust [(a)]	-	-	-	-	(685,195)	-	(34,933)	(720,128)	(720,128)
Other Participant Directed Plans									
Supplemental Annuity Plan	53,966,826	-	-	53,966,826	-	(97,811,442)	(2,360,689)	(100,172,131)	(46,205,305)
Deferred Compensation Plan	14,591,279	-	-	14,591,279	-	(23,136,093)	(762,336)	(23,898,429)	(9,307,150)
Total All Funds	**331,311,475**	**343,706,000**	**29,486,882**	**704,504,357**	**(674,869,596)**	**(152,436,695)**	**(20,149,191)**	**(847,455,482)**	**(142,951,125)**
Total Non-Participant Directed	189,584,787	343,706,000	29,486,882	562,777,669	(674,869,596)	(2,951,204)	(13,432,704)	(691,253,504)	(128,475,835)
Total Participant Directed	141,726,688	-	-	141,726,688	-	(149,485,491)	(6,716,487)	(156,201,978)	(14,475,290)
Total All Funds	**$ 331,311,475**	**$ 343,706,000**	**$ 29,486,882**	**$ 704,504,357**	**$ (674,869,596)**	**$ (152,436,695)**	**$ (20,149,191)**	**$ (847,455,482)**	**$ (142,951,125)**

(a) Employer only contributions.

ALASKA RETIREMENT MANAGEMENT BOARD
SCHEDULE OF NON-INVESTMENT CHANGES BY FUND
(Supplement to the Treasury Division Report)
For the Month Ended October 31, 2020

	Contributions				Expenditures				Net
	Contributions EE and ER	State of Alaska	Other	Total Contributions	Benefits	Refunds & Disbursements	Administrative & Investment	Total Expenditures	Contributions/ (Withdrawals)
Public Employees' Retirement System (PERS)									
Defined Benefit Plans:									
Retirement Pension Trust	$ 30,150,284	$ -	$ 5,868	$ 30,156,152	$ (77,285,611)	$ (1,002,681)	$ (353,588)	$ (78,641,880)	$ (48,485,728)
Retirement Health Care Trust	5,464,890	-	1,265,833	6,730,723	(37,903,881)	-	(1,562,116)	(39,465,997)	(32,735,274)
Total Defined Benefit Plans	35,615,174	-	1,271,701	36,886,875	(115,189,492)	(1,002,681)	(1,915,704)	(118,107,877)	(81,221,002)
Defined Contribution Plans:									
Participant Directed Retirement	15,211,696	-	-	15,211,696	-	(4,238,918)	(618,184)	(4,857,102)	10,354,594
Health Reimbursement Arrangement [(a)]	3,819,755	-	-	3,819,755	(21,647)	-	(12,488)	(34,135)	3,785,620
Retiree Medical Plan [(a)]	1,487,380	-	1,913	1,489,293	(53,846)	-	(18,673)	(72,519)	1,416,774
Occupational Death and Disability: [(a)]									
All Others	306,917	-	-	306,917	(9,071)	-	(3,893)	(12,964)	293,953
Peace Officers and Firefighters	114,286	-	-	114,286	(27,348)	-	(9,400)	(36,748)	77,538
Total Defined Contribution Plans	20,940,034	-	1,913	20,941,947	(111,912)	(4,238,918)	(662,638)	(5,013,468)	15,928,479
Total PERS	**56,555,208**	**-**	**1,273,614**	**57,828,822**	**(115,301,404)**	**(5,241,599)**	**(2,578,342)**	**(123,121,345)**	**(65,292,523)**
Teachers' Retirement System (TRS)									
Defined Benefit Plans:									
Retirement Pension Trust	4,810,332	-	4,185	4,814,517	(41,990,161)	(92,703)	(209,956)	(42,292,820)	(37,478,303)
Retirement Health Care Trust	2,046,358	-	452,097	2,498,455	(11,211,117)	-	(571,913)	(11,783,030)	(9,284,575)
Total Defined Benefit Plans	6,856,690	-	456,282	7,312,972	(53,201,278)	(92,703)	(781,869)	(54,075,850)	(46,762,878)
Defined Contribution Plans:									
Participant Directed Retirement	5,545,071	-	-	5,545,071	-	(1,613,736)	(270,639)	(1,884,375)	3,660,696
Health Reimbursement Arrangement [(a)]	1,088,587	-	-	1,088,587	(6,594)	-	(3,700)	(10,294)	1,078,293
Retiree Medical Plan [(a)]	351,305	-	381	351,686	(43,339)	-	(15,143)	(58,482)	293,204
Occupational Death and Disability [(a)]	29,573	-	-	29,573	(2,024)	-	(3,861)	(5,885)	23,688
Total Defined Contribution Plans	7,014,536	-	381	7,014,917	(51,957)	(1,613,736)	(293,343)	(1,959,036)	5,055,881
Total TRS	**13,871,226**	**-**	**456,663**	**14,327,889**	**(53,253,235)**	**(1,706,439)**	**(1,075,212)**	**(56,034,886)**	**(41,706,997)**
Judicial Retirement System (JRS)									
Defined Benefit Plan Retirement Pension Trust	436,658	-	-	436,658	(1,207,670)	-	(12,100)	(1,219,770)	(783,112)
Defined Benefit Retirement Health Care Trust	45,150	-	4,740	49,890	(116,713)	-	(6,423)	(123,136)	(73,246)
Total JRS	**481,808**	**-**	**4,740**	**486,548**	**(1,324,383)**	**-**	**(18,523)**	**(1,342,906)**	**(856,358)**
National Guard/Naval Militia Retirement System (NGNMRS)									
Defined Benefit Plan Retirement Pension Trust [(a)]	-	-	-	-	(186,073)	-	(9,920)	(195,993)	(195,993)
Other Participant Directed Plans									
Supplemental Annuity Plan	13,695,436	-	-	13,695,436	-	(29,153,554)	(777,874)	(29,931,428)	(16,235,992)
Deferred Compensation Plan	3,505,468	-	-	3,505,468	-	(6,038,231)	(238,764)	(6,276,995)	(2,771,527)
Total All Funds	**88,109,146**	**-**	**1,735,017**	**89,844,163**	**(170,065,095)**	**(42,139,823)**	**-**	**(216,903,553)**	**(127,059,390)**
Total Non-Participant Directed	50,151,475	-	1,735,017	51,886,492	(170,065,095)	(1,095,384)	(2,793,174)	(173,953,653)	(122,067,161)
Total Participant Directed	37,957,671	-	-	37,957,671	-	(41,044,439)	(1,905,461)	(42,949,900)	(4,992,229)
Total All Funds	**$ 88,109,146**	**$ -**	**$ 1,735,017**	**$ 89,844,163**	**$ (170,065,095)**	**$ (42,139,823)**	**$ (4,698,635)**	**$ (216,903,553)**	**$ (127,059,390)**

(a) Employer only contributions.

ALASKA RETIREMENT MANAGEMENT BOARD
SCHEDULE OF NON-INVESTMENT CHANGES BY FUND
(Supplement to the Treasury Division Report)
For the Four Months Ending October 31, 2020

PARTICIPANT DIRECTED DISBURSEMENTS BY PLAN AND TYPE

Type	PERS DCR Plan	TRS DCR Plan	Supplemental Annuity Plan	Deferred Compensation	TOTAL	% of Total
Payment to Beneficiary	$ 19,629	$ -	$ 166,464	$ 29,931	$ 216,024	0.1%
Death Benefit	469,913	447,227	5,230,265	1,058,905	7,206,310	5.0%
Disability / Hardship	-	113,179	1,274	36,991	151,444	0.1%
Minimum Required Distribution	31,548	7,253	2,219,686	604,817	2,863,304	1.9%
Qualified Domestic Relations Order	392,911	87,104	669,239	222,518	1,371,772	0.9%
Separation from Service / Retirement	17,245,219	9,723,973	72,388,440	18,727,620	118,085,252	78.9%
Purchase of Service Credit	-	-	302,236	109,074	411,310	0.3%
Transfer to a Qualifying Plan	-	-	-	-	-	0.0%
CARES Act Distributions	-	-	16,833,838	2,346,237	19,180,075	12.8%
TOTAL	$ 18,159,220	$ 10,378,736	$ 97,811,442	$ 23,136,093	$ 149,485,491	100.0%

PERS & TRS PARTICIPANT DIRECTED DISBURSEMENTS BY PLAN AND VESTED PERCENTAGE

Vesting	PERS DCR Plan	TRS DCR Plan	TOTAL	% of Total
100% Vested	$ 15,897,687	$ 9,356,673	$ 25,254,360	88.5%
75% Vested	277,464	267,019	544,483	1.9%
50% Vested	491,312	167,223	658,535	2.3%
25% Vested	593,022	293,484	886,506	3.1%
0% Vested	899,735	294,337	1,194,072	4.2%
TOTAL	$ 18,159,220	$ 10,378,736	$ 28,537,956	100.0%

DEFINED BENEFIT REFUNDS BY PLAN, TIER, CONTRIBUTION TYPE AND VESTED STATUS

	PERS DB Pension Plan				TRS DB Pension Plan			JRS	TOTAL
Contribution Type	Tier 1	Tier 2	Tier 3	Total	Tier 1	Tier 2	Total	DB Pension Plan	DB Pension Plan
Mandatory Vested	$ 27,896	$ 11,591	$ 563,231	$ 602,718	$ -	$ 58,619	$ 58,619	$ -	$ 661,337.00
Mandatory Non-Vested	135,861	162,111	274,972	572,944	43,629	87,775	131,404	-	704,348
Geographic Differential	-	76,241	50,363	126,604	-	-	-	-	126,604
Voluntary Full	223,196	571,188	557,207	1,351,591	-	-	-	-	1,351,591
Indebtedness, Lagging & Partial	399	30,506	66,269	97,174	-	10,150	10,150	-	107,324
TOTAL	$ 387,352	$ 851,637	$ 1,512,042	$ 2,751,031	$ 43,629	$ 156,544	$ 200,173	$ -	$ 2,951,204

Notes for the DRB Supplement to the Treasury Report

October 2020

This report is the DRB supplement to the Treasury Division's Financial Report. It expands their "Net Contributions (Withdrawals)" column into contributions and expenditures. It shows contributions received from both employees and employers, contributions from the State of Alaska, and other non-investment income. It also expands expenditures into benefits, refunds & disbursements, and administrative & investment expenditures.

The net amount of total contributions and total expenditures, presented as "Net Contributions (Withdrawals)", agrees with the same column in the Treasury Division's Report. Page one shows the year-to-date totals for the first four months of Fiscal Year 2020, while page two shows only the month of October 2020.

Highlights – On page one, for the four months ending October 31, 2020:

- PERS DB Pension – Average employer and employee contributions of $29.1 million per month; benefit payments of approximately $76.7 million per month; refunds average $688 thousand; and Administrative and Investment expenditures of $377 thousand per month (DOR and DRB).

- PERS DB Healthcare – Average employer contributions of $5.9 million per month; benefit payments of approximately $36.8 million per month; and average Administrative and Investment expenditures of $2.2 million per month (DOR and DRB).

- PERS DC Pension – Average employer and employee contributions of $14.4 million per month; participant disbursements average $4.5 million per month; and average Administrative and Investment expenditures of $670 thousand per month (DOR and DRB).

- PERS DCR Health – For HRA, RMP, and OD&D, only employer contributions average $5.4 million per month on behalf of participating employees; benefit payments of approximately $109 thousand per month. Currently, 68 benefits are being paid from the Occupational Death & Disability plans, 51 retirees are participating in RMP, and 80 retirees are participating in HRA. Administrative and investment expenditures were approximately $22 thousand per month (DOR and DRB).

- TRS DB Pension - Average employer and employee contributions of $3.9 million per month; benefit payments of approximately $41.9 million per month; refunds average $50 thousand; and average Administrative and Investment expenditures of $198 thousand per month (DOR and DRB).

- TRS DB Healthcare – Average employer contributions of $1.3 million per month; benefit payments of approximately $11.6 million per month; and average Administrative and Investment expenditures of $567 thousand per month (DOR and DRB).

- TRS DC Pension – Average employer and employee contributions of $3.9 million per month; participant disbursements average $2.6 million per month; and average Administrative and investment expenditures of $228 thousand per month (DOR and DRB).

- TRS DCR Health – For HRA, RMP, and OD&D, only employer contributions average $1.1 million per month on behalf of participating employees; benefit payments of approximately $37 thousand per month. Currently, 19 benefits are being paid from the Occupational Death & Disability plans, 22 retirees are participating in RMP, and 29 retirees are participating in HRA. Administrative and investment expenditures were approximately $9 thousand per month (DOR and DRB).

- JRS Pension – Average employer and employee contributions of $618 thousand per month; benefit payments of approximately $1.2 million per month; and average Administrative and Investment expenditures of $10 thousand per month (DOR and DRB).

- JRS Healthcare – Average employer contributions of $64 thousand per month; benefit payments of approximately $154 thousand and average Administrative and Investment expenditures of $6 thousand per month (DOR and DRB).

- NGNMRS – A combination of lump-sum and monthly benefit payments of $171 thousand per month; and average Administrative and Investment expenditures of $9 thousand per month (DOR and DRB).

- SBS – Average employer and employee contributions and transfers in of $13.5 million per month. Participant disbursements average of $24.5 million per month; and average Administrative and Investment expenditures of $590 thousand per month (DOR and DRB).

- Deferred Compensation – Average member-only contributions and transfers in of $3.6 million per month; participant disbursements average of $5.8 million per month; and average Administrative and Investment expenditures of $191 thousand per month (DOR and DRB).

Highlights – On page two, activity for the one month of October 2020 only:

- PERS DB Pension – Nothing significant to report
- PERS DB Healthcare – Other Income of $1.3 million from OptumRx EGWP subsidies.
- TRS DB Pension – Nothing significant to report
- TRS DB Healthcare – Other Income of $451 thousand from OptumRx EGWP subsidies.
- JRS Healthcare – Other Income of $5 thousand from OptumRx EGWP subsidies.
- All other funds – Nothing significant to report

If you have any questions or comments, please let me know.

THE STATE of ALASKA
GOVERNOR MIKE DUNLEAVY

Department of Revenue
ALASKA RETIREMENT MANAGEMENT BOARD
PO Box 110405
Juneau, Alaska 99811-0405
Main: 907.465.3749

November 2, 2020

Mr. Norm West
[redacted]

Re: Appreciation for your Service

Dear Norm:

Thank you so much for your four-plus years of service as a Trustee of the Alaska Retirement Management Board. You brought a unique and useful corporate perspective to the board. You were able to do this because you had fantastic and in-depth institutional knowledge with a healthy perspective on both the asset and liability sides of the pension systems. Besides the knowledge you shared with your fellow trustees, you were, simply put, a joy to be around with a load of fine stories to share. Your long and elaborate questions will always be remembered!

The trustees of the board have truly appreciated your devoted service. In particular we trustees appreciated your efforts as chair of the actuarial committee and your careful participation in other committees such as the audit committee. You also put in many hours as an evaluator of RFPs. You most recently were unanimously elected by your colleagues as vice-chair of the board. At all times you performed with the utmost professionalism. We will miss you.

The trustees of the ARMB, including past trustees, wish you all the best on all your future endeavors. You have been a great colleague and friend. Thank you!

Sincerely,

Robert M. Johnson, Chair

REPORT ON ALASKA RETIREE HEALTH PLAN ADVISORY BOARD MEETING NOVEMBER 5, 2020

The advisory board facilitates engagement and coordination between the State's retirement systems' members, the ARMB, and the Commissioner regarding the administration of the retiree health plan. Following are items discussed at the November 5, 2020 meeting.

IRMAA Surcharges

Certain high-income retirees are required to pay an extra Income Related Monthly Adjustment Amount (IRMAA) surcharge for being enrolled in the AlaskaCare Employer Group Wavier Program (EGWP) prescription drug coverage. Retirees that are subject to the IRMAA surcharge will be reimbursed by the Division for the full amount through a tax-advantaged Health Reimbursement Arrangement (HRA) account.

PayFlex will continue processing IRMAA reimbursements for 2020 that are submitted before December 15, 2020. Beginning in 2021, OptumRx and Optum Bank will handle IRMAA reimbursements. Retirees will need to set up their HRA account every year, since IRMAA surcharges are based on the individual's annual income. There is no need to setup an account if there is no surcharge assessed.

AlaskaCare Retiree DB Insurance Changes

New section 3.3.25 COVID-19 Testing and Vaccinations added to clarify plan coverage of COVID-19 testing and vaccinations per the CARES Act.
The medical plan will cover medically necessary, FDA approved COVID-19 testing at 100%, subject to recognized charge.
COVID-19 Vaccinations - The medical plan will cover FDA approved COVID-19 vaccinations at 100%, subject to recognized charge.

Medicare Advantage

The Division received responses from the request for information that was released to assess the market's Medicare Advantage capabilities and interest for the AlaskaCare Retirees as there is not currently any Medicare Advantage plan in Alaska. There is interest from major carriers. Estimated premiums appear to provide financial opportunity. The carriers would need to meet the 51% CMS requirement for a MAPPO program. It is considered feasible to meet this requirement in 1 - 3 years.

Next steps will evaluate the impact on retiree plan(s) in aggregate and stakeholder discussions as this develops.

State of Alaska Retirement Systems

Presentation to ARMB Actuarial Committee

Preliminary June 30, 2020 Valuation Results
PERS/TRS – DB and DCR

December 2, 2020

Agenda

Purpose of the Valuations

Purpose of the 2020 Valuations

- Measure each plan’s funded status as of June 30, 2020

- Compare *actual* FY20 experience (assets and liabilities) to *expected* experience based on the assumptions used in the 2019 valuations

- Provide the basis for setting FY23 contribution rates

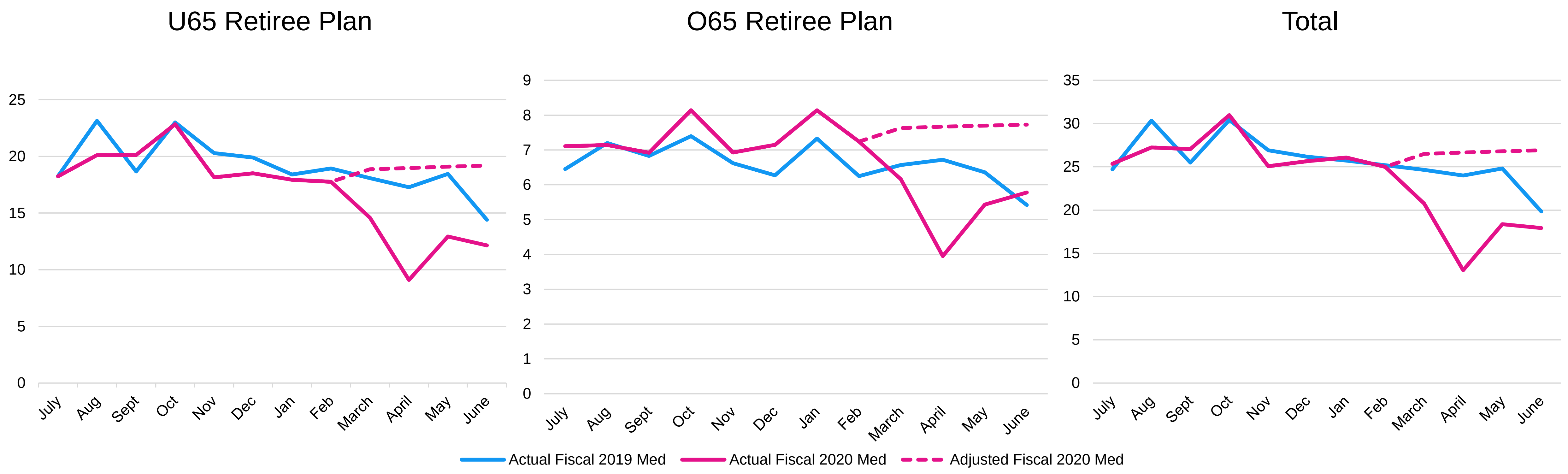
2020 Valuation Highlights

Highlights of 2020 Valuation Results

- FY20 asset returns were **less than** the 7.38% expected return
  - — Market returns were approximately 4.1% (DB) and 4.3% (DCR)
  - — Due to 5-year asset smoothing, actuarial returns were approximately 5.8% (DB) and 6.2% (DCR)
- Liabilities at 6/30/20 are generally **less than** expected compared to the 6/30/19 valuation liabilities, thereby creating liability *gains**. Details are provided on slides 15, 21, 25 and 29.
- The combination of *unfavorable* asset experience and *favorable* liability experience resulted in Employer/State contribution rates as of 6/30/20 that are **slightly higher than** the corresponding rates as of 6/30/19.
- Based on these preliminary results, the projected FY23 Additional State Contributions will likely be **higher than** the amounts from the 2019 valuation projections. This will be discussed further at the March meeting.

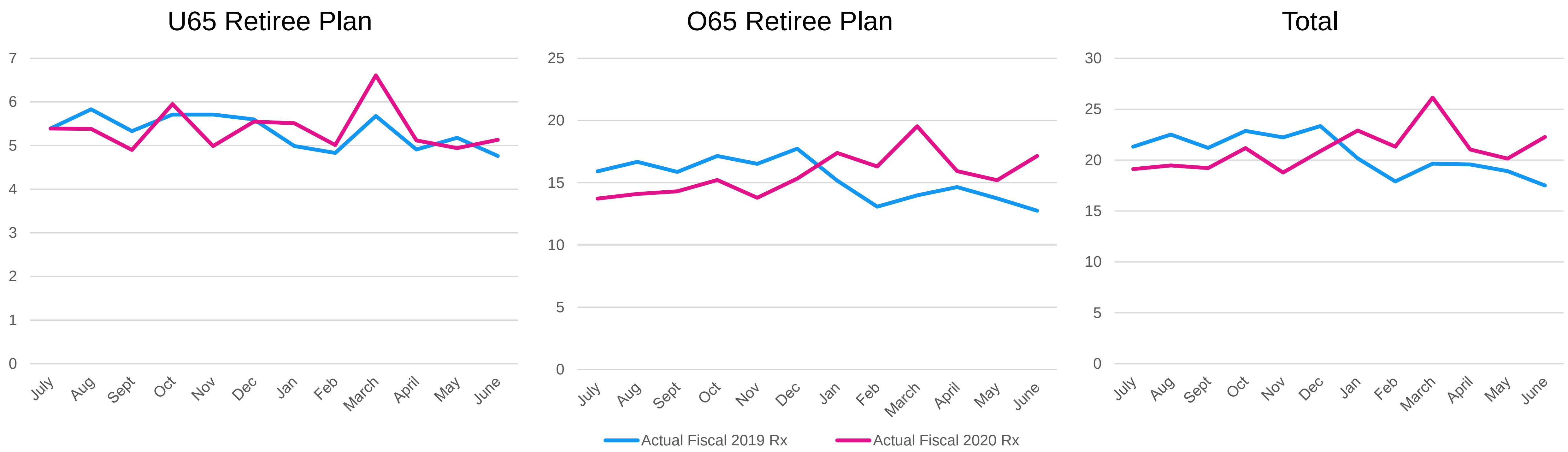
* There were liability *losses* for PERS DCR and TRS DCR Retiree Medical

COVID-19 Impact – Medical Incurred Claims
($millions)



- Material decrease in medical claims during March – June of 2020 due to COVID-19
- An adjustment was made for those months to eliminate the decrease that is not expected to continue in future years

COVID-19 Impact – Rx Incurred Claims
($millions)



- Observed a spike in prescription drug claims in March 2020
- However, fiscal 2020 prescription drug experience in total appears reasonable to use without adjustment for COVID-19

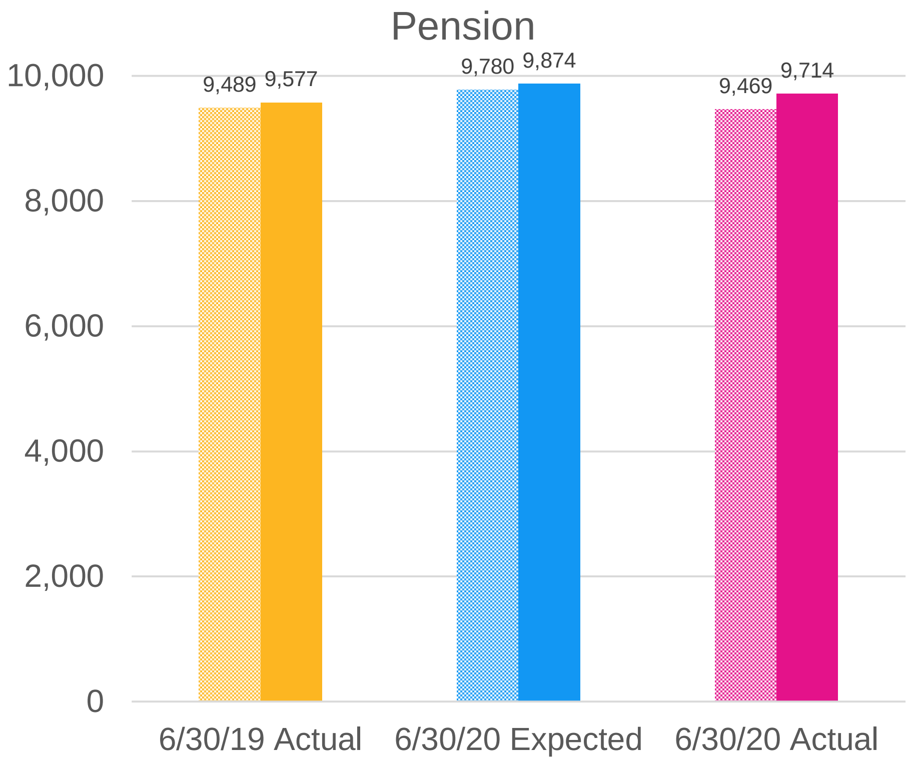
Preliminary 2020 Valuation Results - PERS

Explanation of Terms

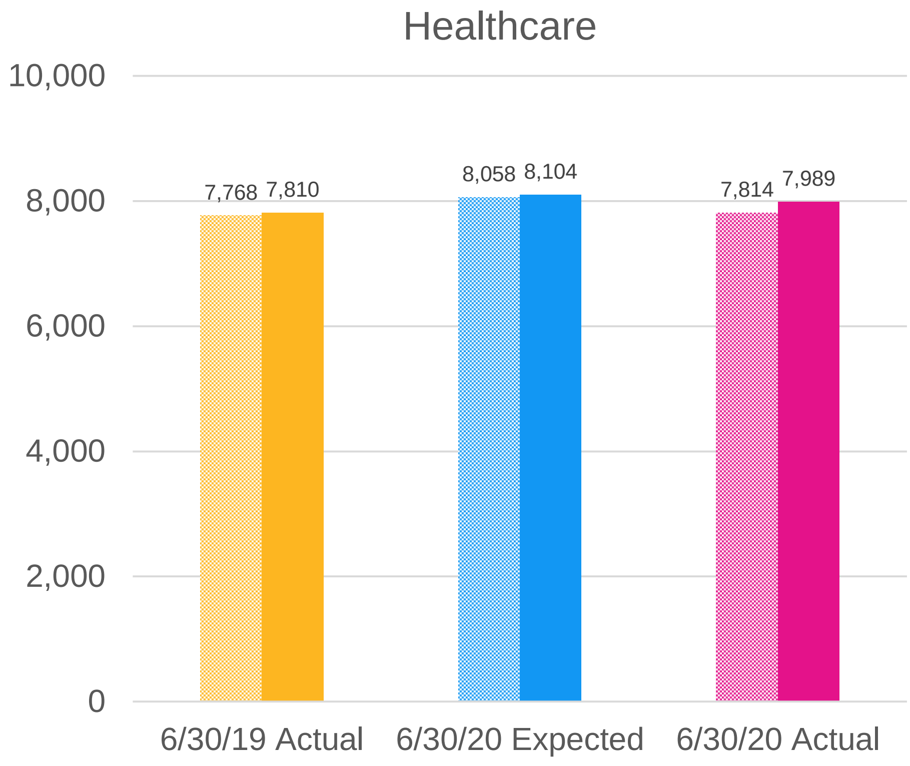
- “6/30/19 Actual”
  - The results from the 6/30/19 valuation
- “6/30/20 Expected”
  - The results if FY20 experience matched all of the assumptions that were used in the 6/30/19 valuation (e.g., assets earned 7.38%, salaries increased as expected, members retired according to what the retirement assumption predicted, etc.)
- “6/30/20 Actual”
  - The results reflecting actual FY20 asset performance, and actual changes in the participant data from 6/30/19 to 6/30/20
- Gains and losses are the differences between “6/30/20 Expected” and “6/30/20 Actual”
  - If the difference is *favorable* to the plan, we have a gain
  - If the difference is *unfavorable* to the plan, we have a loss

PERS: Assets
($millions)

Market Value (MVA): Pattern
Actuarial Value (AVA): Solid



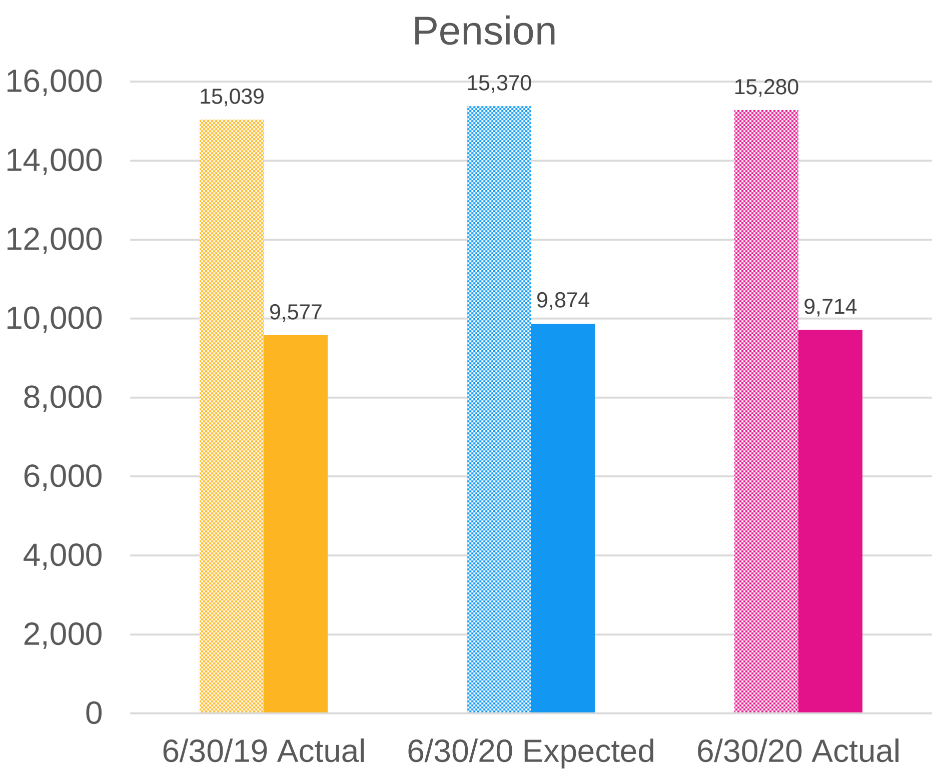
Approximate FY20 return: 4.1% (MVA); 5.8% (AVA)
FY20 asset loss: $310.8M (MVA); $160.0M (AVA)



Approximate FY20 return: 4.1% (MVA); 5.8% (AVA)
FY20 asset loss: $244.8M (MVA); $114.9M (AVA)

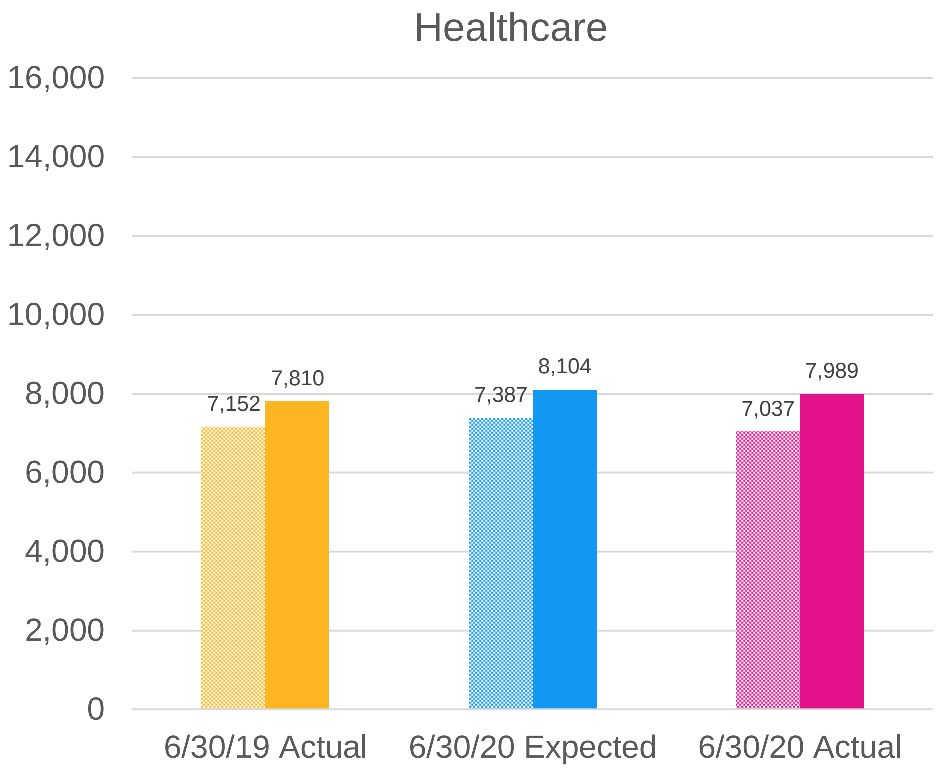
PERS: Assets vs. Liabilities
($millions)

Actuarial Accrued Liability (AAL): Pattern
Actuarial Value of Assets (AVA): Solid



FY20 AAL gain: $90.8M

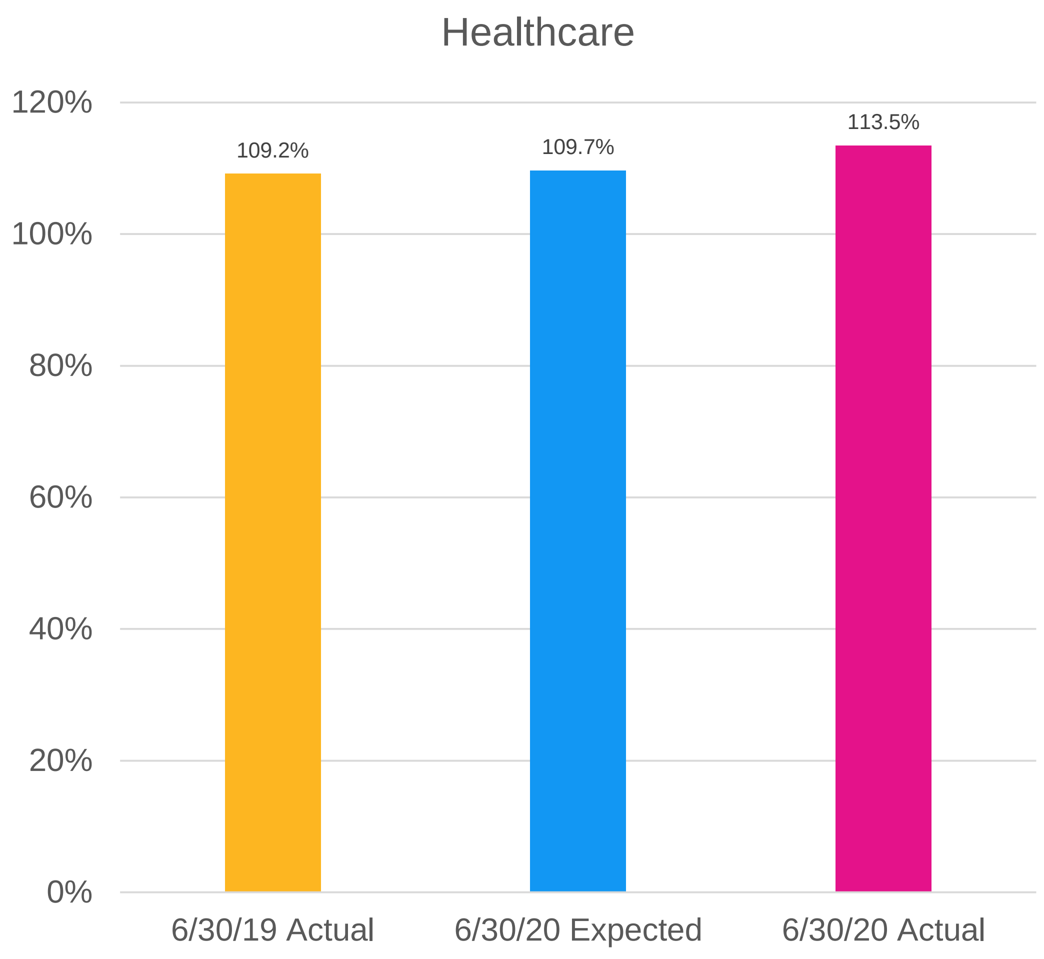
FY20 AVA loss: $160.0M



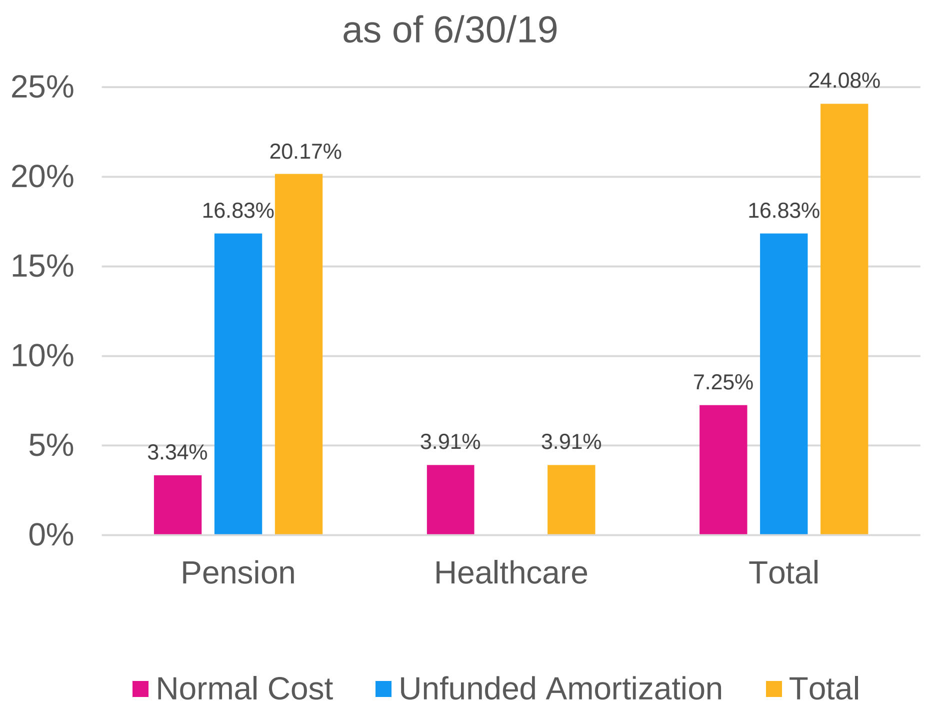
FY20 AAL gain: $350.0M

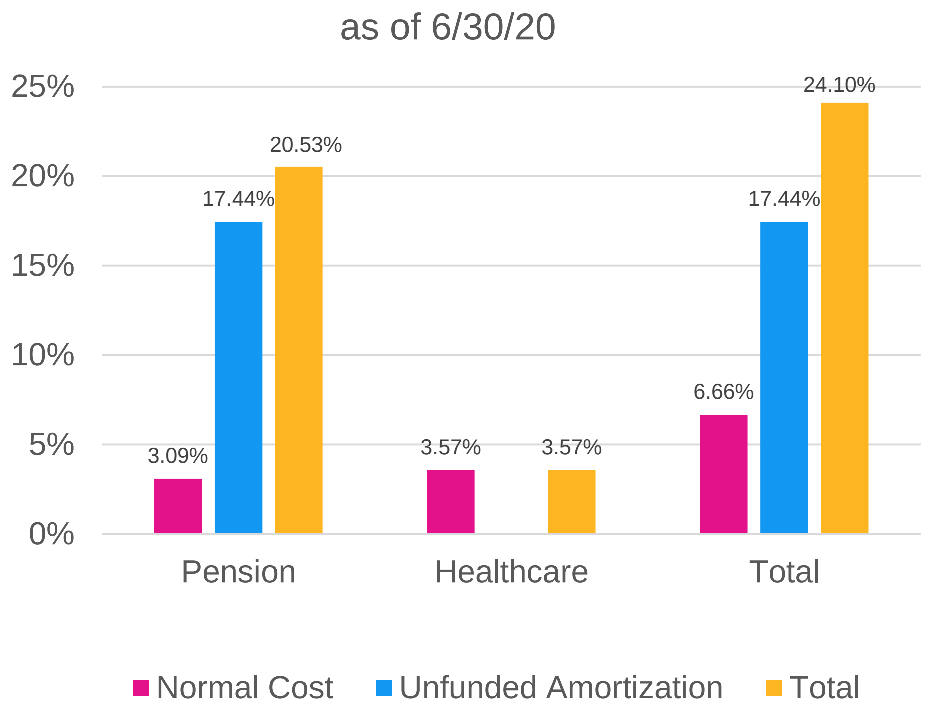
FY20 AVA loss: $114.9M

PERS: Funded Status (AVA vs. AAL)



PERS: Employer/State Contribution Rates
(% of DB/DCR payroll)





PERS: FY20 Actuarial Gains/(Losses)

($millions)

	Pension	Healthcare	Total
Actuarial Accrued Liabilities			
- Demographic Experience (non-mortality)	(7.0)	(2.3)	(9.3)
- Mortality Experience	(6.4)	0.2	(6.2)
- Salary Increases	11.2	n/a	11.2
- Rehires (net of rehire load)	8.4	16.0	24.4
- COLA/PRPA Increases	78.8	n/a	78.8
- Per Capita Claims Cost	n/a	278.8	278.8
- COVID-19 Experience	n/a	25.9	25.9
- Medicare Part B Only Experience	n/a	6.3	6.3
- Changes in Dependent Coverage Elections	n/a	23.4	23.4
- Miscellaneous*	5.8	1.7	7.5
- Total	90.8	350.0	440.8
Actuarial Value of Assets	(160.0)	(114.9)	(274.9)
Actual vs Expected Contributions	(55.4)	59.1	3.7
Actual vs Expected Admin Expenses	0.1	(2.4)	(2.3)
TOTAL	(124.5)	291.8	167.3

FY19 liability and asset gains/(losses) for comparison purposes ($millions):

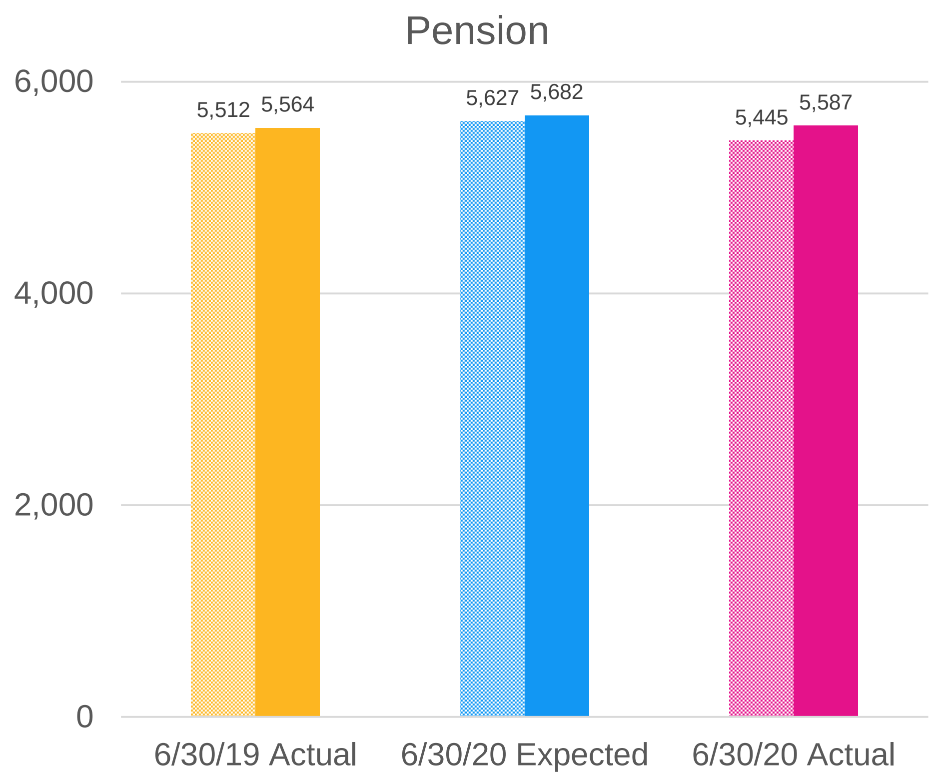
- Actuarial Accrued Liabilities
  - Pension: $(75.5)
  - Healthcare: $775.3
  - Total: $699.8
- Actuarial Value of Assets
  - Pension: $(181.6)
  - Healthcare: $(138.3)
  - Total: $(319.9)

* Includes the effects of various data changes that are typical when new census data is received for the annual valuation, the effects of the differences between expected and actual benefit payments, and other items that do not fit neatly into any of the other categories shown on this slide.

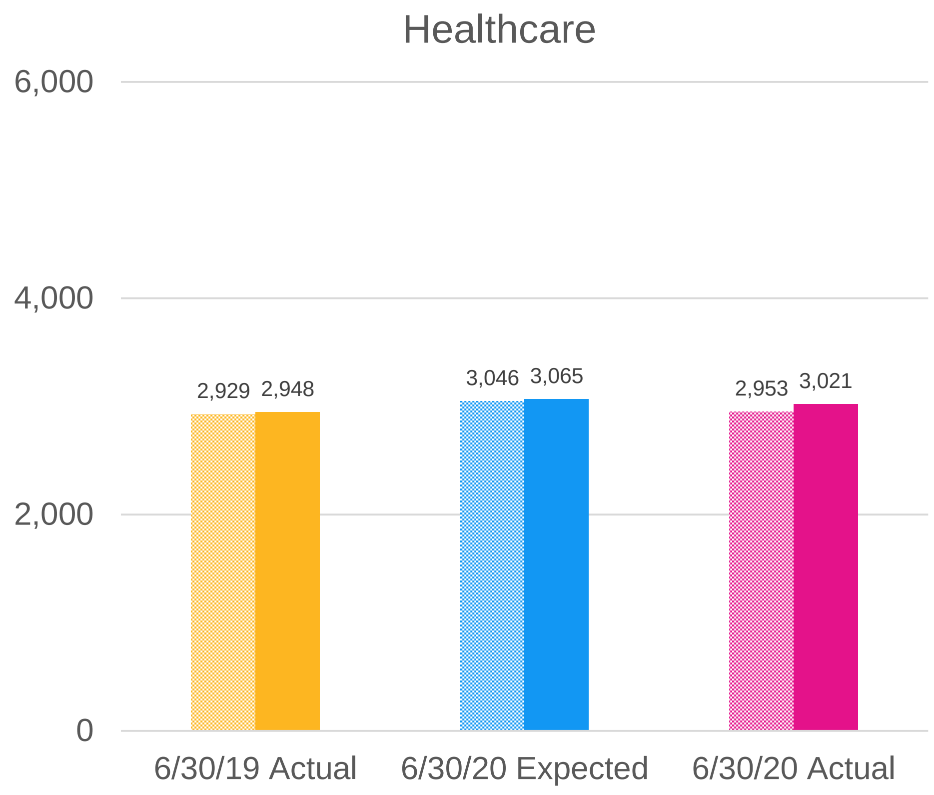
Preliminary 2020 Valuation Results - TRS

TRS: Assets
($millions)

Market Value (MVA): Pattern
Actuarial Value (AVA): Solid



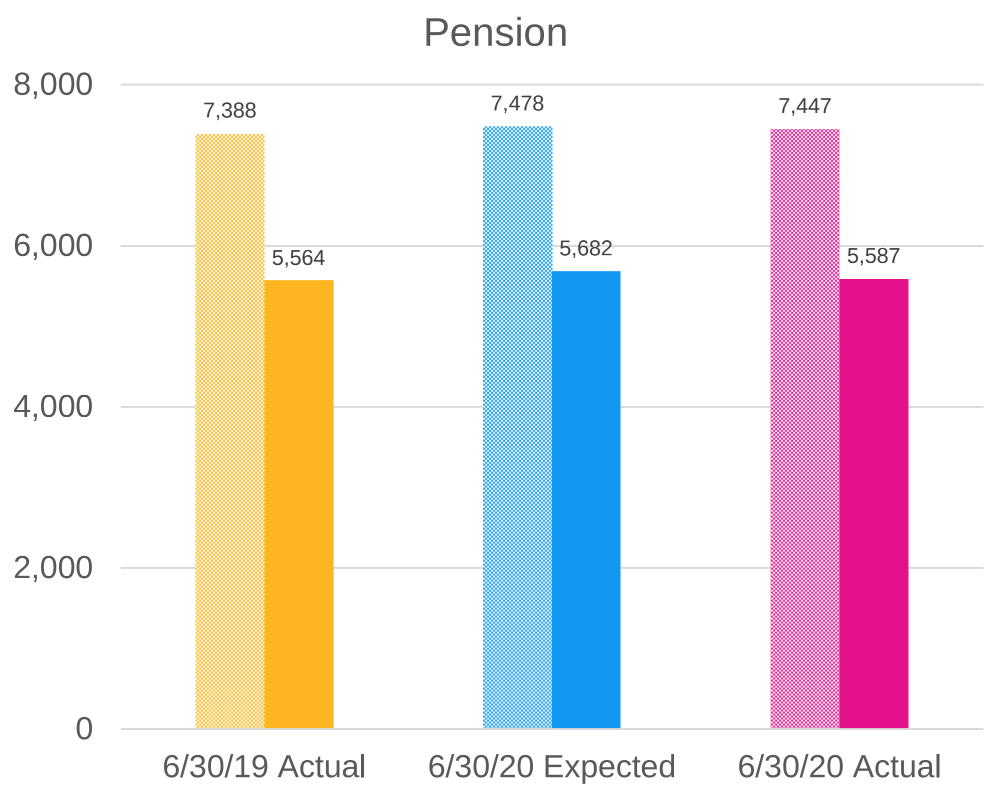
Approximate FY20 return: 4.1% (MVA); 5.8% (AVA)
FY20 asset loss: $181.8M (MVA); $95.4M (AVA)



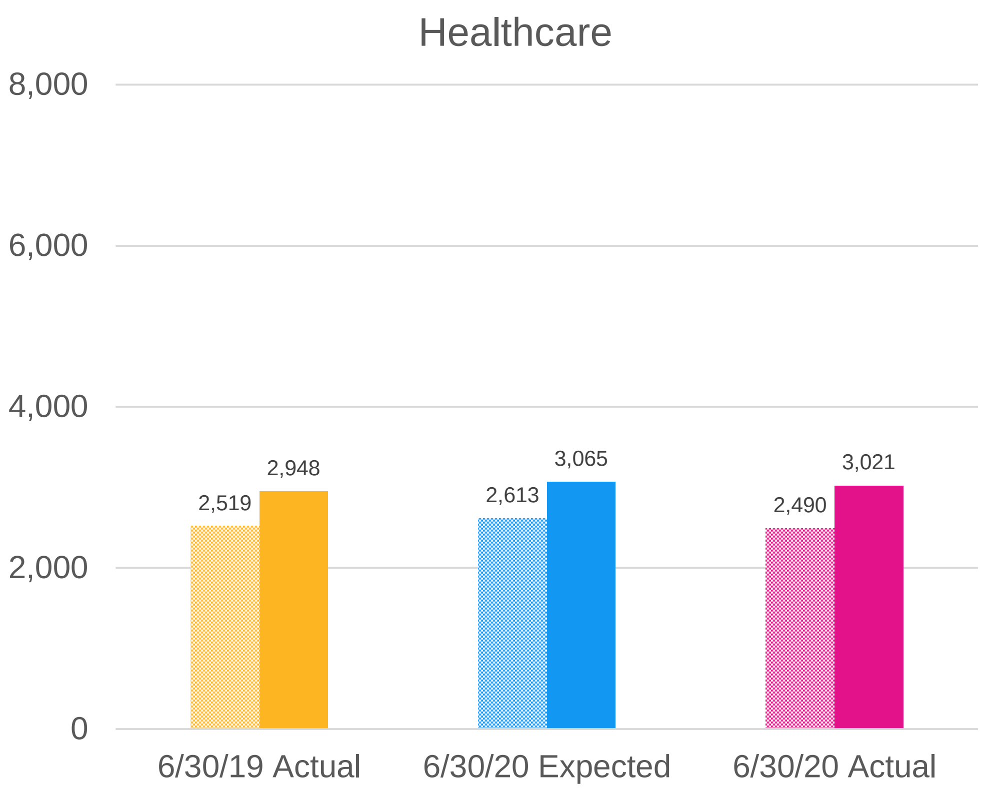
Approximate FY20 return: 4.1% (MVA); 5.8% (AVA)
FY20 asset loss: $92.4M (MVA); $44.1M (AVA)

TRS: Assets vs. Liabilities
($millions)

Actuarial Accrued Liability (AAL): Pattern
Actuarial Value of Assets (AVA): Solid

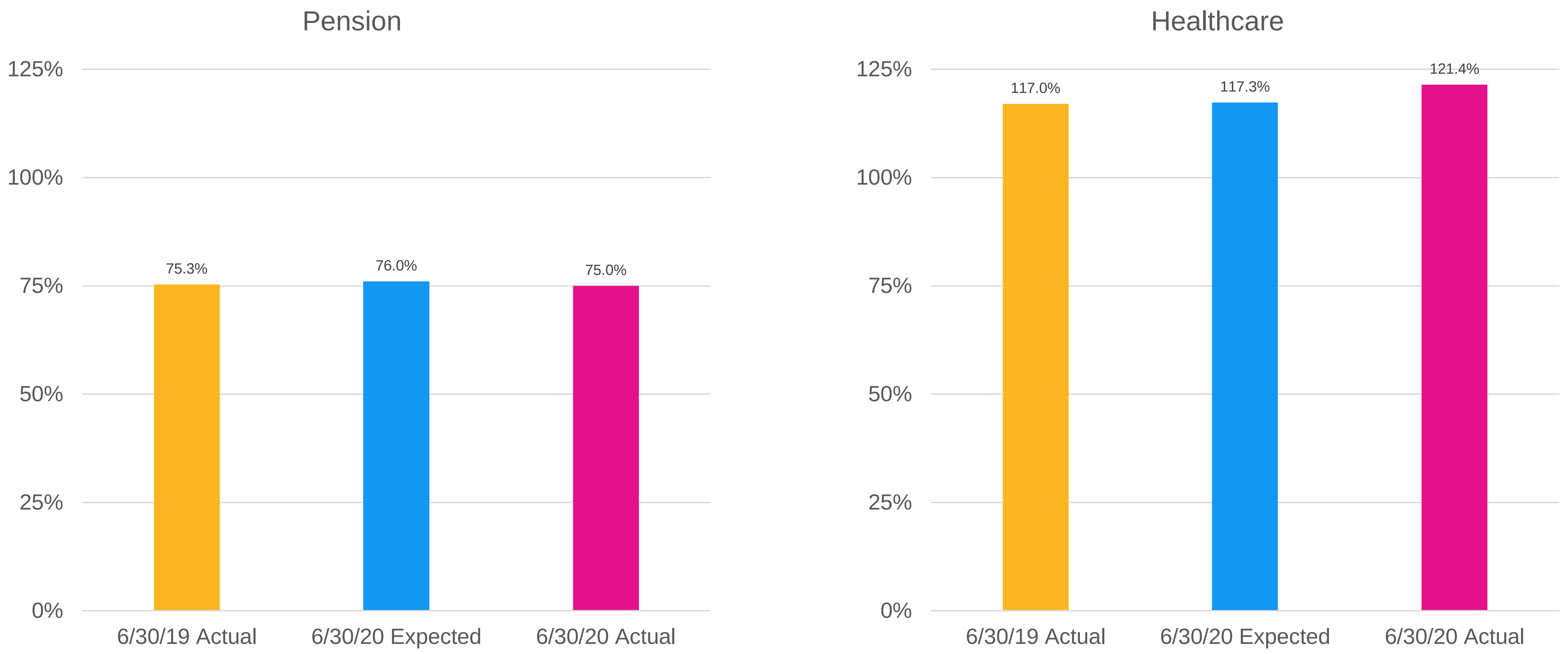


FY20 AAL gain: $30.9M
FY20 AVA loss: $95.4M

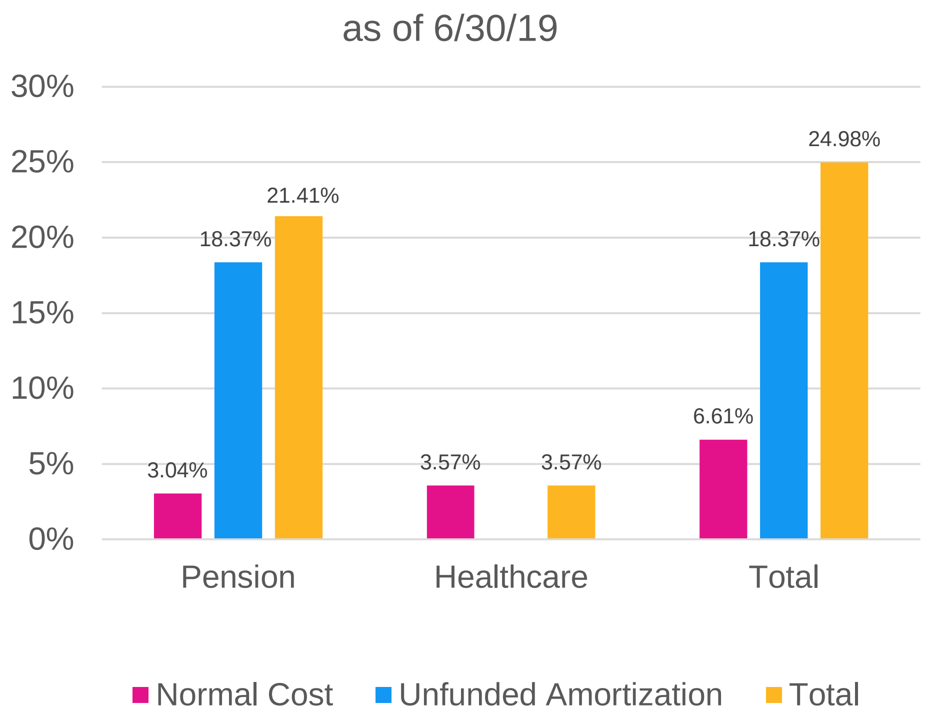


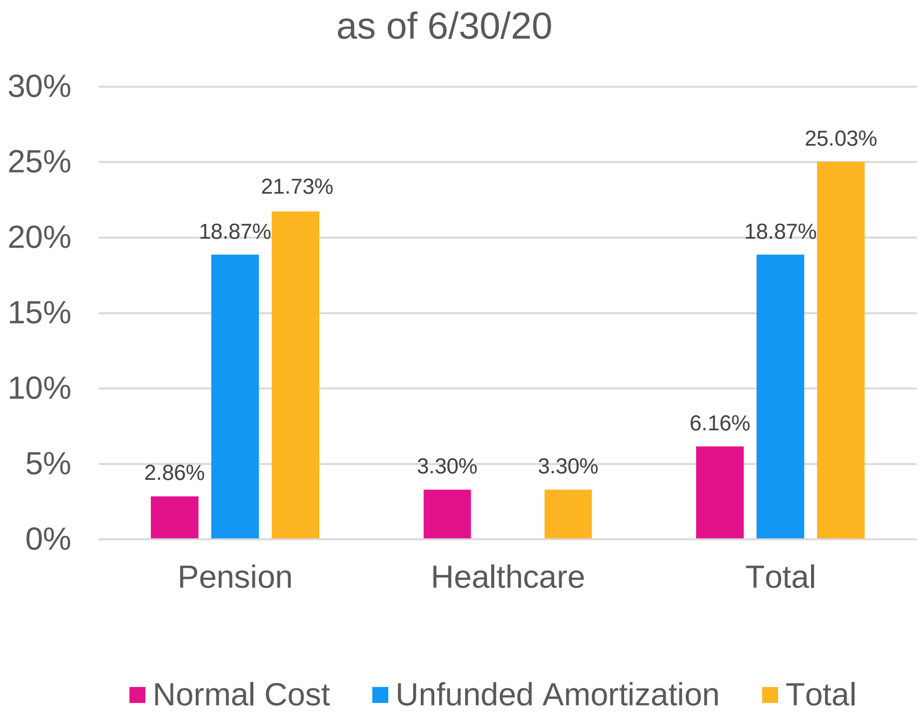
FY20 AAL gain: $123.4M
FY20 AVA loss: $44.1M

TRS: Funded Status (AVA vs. AAL)



TRS: Employer/State Contribution Rates
(% of DB/DCR payroll)





TRS: FY20 Actuarial Gains/(Losses)
($millions)

	Pension	Healthcare	Total
Actuarial Accrued Liabilities			
- Demographic Experience (non-mortality)	(3.8)	1.0	(2.8)
- Mortality Experience	(11.2)	(2.3)	(13.5)
- Salary Increases	6.4	n/a	6.4
- Rehires (net of rehire load)	(0.7)	5.5	4.8
- COLA/PRPA Increases	43.4	n/a	43.4
- Per Capita Claims Cost	n/a	96.8	96.8
- COVID-19 Experience	n/a	17.3	17.3
- Medicare Part B Only Experience	n/a	2.1	2.1
- Changes in Dependent Coverage Elections	n/a	7.4	7.4
- Miscellaneous*	(3.2)	(4.4)	(7.6)
- Total	30.9	123.4	154.3
Actuarial Value of Assets	(95.4)	(44.1)	(139.5)
Actual vs Expected Contributions	20.0	22.1	42.1
Actual vs Expected Admin Expenses	0.2	0.1	0.3
TOTAL	(44.3)	101.5	57.2

FY19 liability and asset gains/(losses) for comparison purposes ($millions):

- Actuarial Accrued Liabilities
  - Pension: $(7.5)
  - Healthcare: $262.4
  - Total: $254.9
- Actuarial Value of Assets
  - Pension: $(104.2)
  - Healthcare: $(50.8)
  - Total: $(155.0)

* Includes the effects of various data changes that are typical when new census data is received for the annual valuation, the effects of the differences between expected and actual benefit payments, and other items that do not fit neatly into any of the other categories shown on this slide.

Preliminary 2020 Valuation Results – PERS DCR

PERS DCR: Preliminary Valuation Results
($000's)

	Occ D&D	Retiree Medical	Total
As of June 30, 2020			
- Actuarial Accrued Liability	10,634	150,701	161,335
- Actuarial Value of Assets	43,029	144,747	187,776
- Unfunded Liability	(32,395)	5,954	(26,441)
- Funded Ratio*	404.6%	96.0%	116.4%
As of June 30, 2019			
- Actuarial Accrued Liability	9,774	124,946	134,720
- Actuarial Value of Assets	36,701	118,783	155,484
- Unfunded Liability	(26,927)	6,163	(20,764)
- Funded Ratio*	375.5%	95.1%	115.4%

* Based on Actuarial Value of Assets

PERS DCR: Employer Contribution Rates
(% of DCR payroll)

	Occ D&D	Retiree Medical	Total
As of June 30, 2020			
- Normal Cost	0.36%	1.05%	1.41%
- Unfunded Amortization	0.00%	0.05%	0.05%
- Total	0.36%	1.10%	1.46%
As of June 30, 2019			
- Normal Cost	0.36%	1.02%	1.38%
- Unfunded Amortization	0.00%	0.05%	0.05%
- Total	0.36%	1.07%	1.43%

PERS DCR: FY20 Actuarial Gains/(Losses)
($000's)

	Occ D&D	Retiree Medical	Total
Actuarial Accrued Liabilities			
- Demographic Experience (non-mortality)	2,378	1,668	4,046
- Mortality Experience	1,775	243	2,018
- Salary Increases	(25)	n/a	(25)
- New Entrants/Rehires	(175)	(4,628)	(4,803)
- Per Capita Claims Cost	n/a	7,735	7,735
- COVID-19 Experience	n/a	128	128
- Elimination of 0.2% Annual Trend Rate Adjustment	n/a	(7,485)	(7,485)
- Miscellaneous*	573	531	1,104
- Total	4,526	(1,808)	2,718
Actuarial Value of Assets	(429)	(1,232)	(1,661)
Actual vs Expected Contributions	1,497	2,943	4,440
Actual vs Expected Admin Expenses	1	(18)	(17)
TOTAL	5,595	(115)	5,480

FY19 liability and asset gains/(losses) for comparison purposes ($000's):

- Actuarial Accrued Liabilities
  - — Occ D&D: $2,817
  - — Ret Med: $17,316
  - — Total: $20,133
- Actuarial Value of Assets
  - — Occ D&D: $(363)
  - — Ret Med: $(754)
  - — Total: $(1,117)

* Includes the effects of various data changes that are typical when new census data is received for the annual valuation, the effects of the differences between expected and actual benefit payments, and other items that do not fit neatly into any of the other categories shown on this slide.

Preliminary 2020 Valuation Results – TRS DCR

TRS DCR: Preliminary Valuation Results

($000's)

	Occ D&D	Retiree Medical	Total
As of June 30, 2020			
- Actuarial Accrued Liability	223	40,634	40,857
- Actuarial Value of Assets	4,933	49,554	54,487
- Unfunded Liability	(4,710)	(8,920)	(13,630)
- Funded Ratio*	2,212.1%	122.0%	133.4%
As of June 30, 2019			
- Actuarial Accrued Liability	240	32,981	33,221
- Actuarial Value of Assets	4,359	42,307	46,666
- Unfunded Liability	(4,119)	(9,326)	(13,445)
- Funded Ratio*	1,816.3%	128.3%	140.5%

* Based on Actuarial Value of Assets

TRS DCR: Employer Contribution Rates
(% of DCR payroll)

	Occ D&D	Retiree Medical	Total
As of June 30, 2020			
- Normal Cost	0.08%	0.87%	0.95%
- Unfunded Amortization	0.00%	0.00%	0.00%
- Total	0.08%	0.87%	0.95%
As of June 30, 2019			
- Normal Cost	0.08%	0.83%	0.91%
- Unfunded Amortization	0.00%	0.00%	0.00%
- Total	0.08%	0.83%	0.91%

TRS DCR: FY20 Actuarial Gains/(Losses)
($000's)

	Occ D&D	Retiree Medical	Total
Actuarial Accrued Liabilities			
- Demographic Experience (non-mortality)	195	963	1,158
- Mortality Experience	110	(50)	60
- Salary Increases	0	n/a	0
- New Entrants/Rehires	1	(2,809)	(2,808)
- Per Capita Claims Cost	n/a	2,130	2,130
- COVID-19 Experience	n/a	32	32
- Elimination of 0.2% Annual Trend Rate Adjustment	n/a	(2,153)	(2,153)
- Miscellaneous*	9	(151)	(142)
- Total	315	(2,038)	(1,723)
Actuarial Value of Assets	(64)	(483)	(547)
Actual vs Expected Contributions	386	2,027	2,413
Actual vs Expected Admin Expenses	0	(4)	(4)
TOTAL	637	(498)	139

FY19 liability and asset gains/(losses) for comparison purposes ($000's):

- Actuarial Accrued Liabilities
  - Occ D&D: $59
  - Ret Med: $5,254
  - Total: $5,313
- Actuarial Value of Assets
  - Occ D&D: $(68)
  - Ret Med: $(341)
  - Total: $(409)

* Includes the effects of various data changes that are typical when new census data is received for the annual valuation, the effects of the differences between expected and actual benefit payments, and other items that do not fit neatly into any of the other categories shown on this slide.

Next Steps

Next Steps

- Complete JRS and NGNMRS valuations
- Perform projections of assets, liabilities and contributions
- Prepare draft valuation reports
- Meet in March to discuss these items

Actuarial Certification

Actuarial Certification

The purpose of this presentation is to provide the ARMB Actuarial Committee with preliminary June 30, 2020 valuation results for discussion at the December 2, 2020 meeting. Additional valuation results will be presented at the March 17, 2021 meeting. This presentation should be considered part of the June 30, 2020 actuarial valuation report services.

The data, assumptions, methods, and plan provisions used to determine the results shown in this presentation are as shown in the June 30, 2020 actuarial valuation reports (draft reports will be provided within the next couple of months). The June 30, 2020 actuarial valuation reports will include information related to potential risks associated with the plans, and information regarding our use of models.

Where presented, references to “funded ratio” and “unfunded actuarial accrued liability” typically are measured on an actuarial value of assets basis. It should be noted that the same measurements using market value of assets would result in different funded ratios and unfunded actuarial accrued liabilities. Moreover, the funded ratio presented is appropriate for evaluating the need and level of future contributions but makes no assessment regarding the funded status of the plan if the plan were to settle (i.e., purchase annuities) all or a portion of its liabilities.

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the economic and demographic assumptions, increases or decreases expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions or applicable law.

The results were prepared under the direction of David Kershner and Scott Young, both of whom meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. These results have been prepared in accordance with all applicable Actuarial Standards of Practice.

David Kershner
FSA, EA, MAAA, FCA
Principal, Retirement

Scott Young
FSA, EA, MAAA
Director, Health

Alaska Division of Retirement & Benefits

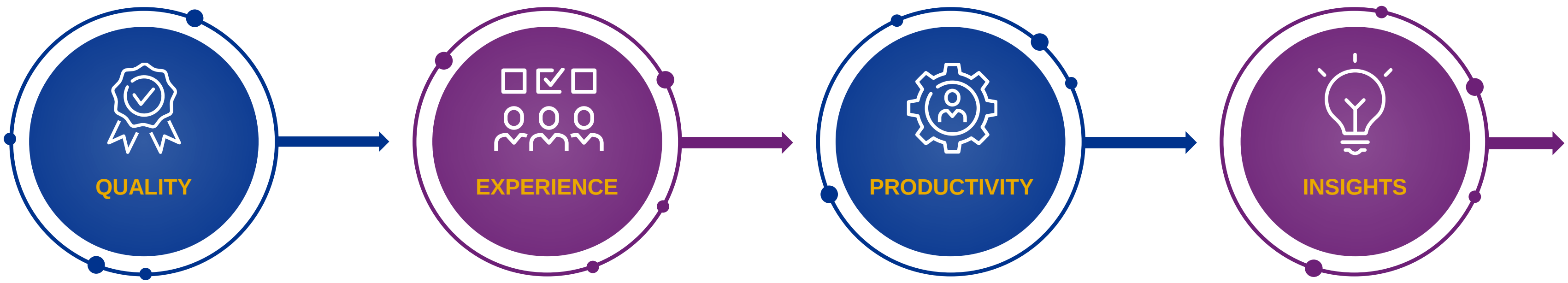
Discussion with the Audit Committee

FY20 Audit Results

December 2, 2020

Our commitment to you

We aim to deliver an exceptional client experience by focusing on



Quality in all that we do and how we deliver

We are committed to delivering a thoughtful, transparent and coordinated approach

Risk based auditing by enabling our people through the design, execution, and automation of our processes

Having best-in-class industry and topical insights, which help our auditors make better decisions and share those relevant insights

Summary: Audit results required communications and other matters

Audit Results

	Response
Significant unusual transactions	No significant unusual transactions identified during the audit.
Uncorrected audit misstatements	No uncorrected misstatements identified during the audit.
Corrected audit misstatements	No corrected misstatements identified during the audit.
Financial presentation and disclosure omissions	No matters to communicate.
Changes to our planned risk assessment and audit strategy	No matters to report.
Significant accounting policies and practices	No matters to report.
Going concern	No matters to report.
Subsequent events	No matters to report.
Illegal acts or fraud	No actual or suspected fraud involving management, employees with significant roles in internal control, or where fraud results in a material misstatement in the financial statements were identified during the audit.
Noncompliance with laws and regulations	No matters to report.
Significant difficulties encountered during the audit	During our testing over the terminated but not yet receiving benefits population in the National Guard and Naval Militia Retirement System, we were unable to obtain the appropriate supporting documents to validate that the information included was accurate. We have discussed with management and have issued a qualified opinion.
Significant findings or issues discussed, or the subject of correspondence, with management	No matters to report.
Management's consultation with other accountants	No matters to report.
Difficult or contentious matters for which the auditor consulted	No matters to report.
Disagreements with management	No matters to report.
Other significant matters	No matters to report.
Written communications	Management representation letters, including summary of uncorrected misstatement, and internal control deficiency letter, to be distributed under separate covers.

Material weaknesses and significant deficiencies in internal control

Material weaknesses

Description	Potential effects	Status
NGNMRS does not have appropriate controls in place to determine the accuracy of the terminated not receiving benefits population of members used to calculate the total pension liability	The total pension liability presented in the NGNMRS footnotes could be materially misstated.	Material weakness that has not yet been remediated.

Significant deficiencies

Description	Potential effects	Status
None		

Auditors’ report

Modifications

- We have issued unmodified opinions for the following systems:
  - Public Employees’ Retirement System (PERS)
  - Teachers’ Retirement System (TRS)
  - Judicial Retirement System (JRS)
  - Deferred Compensation Plan (DCP)
  - Supplemental Benefits System (SBS)
- We have issued a qualified opinion for a scope limitation for the following system:
  - National Guard and Naval Militia Retirement System

Emphasis of matter or other matter paragraphs

- Other matter paragraphs will be added to each System as relevant for:
  - Prior year comparative information
  - Required supplementary information
  - Supplemental schedules

Significant accounting policies and practices

Description of significant accounting policies and practices	Audit findings
— The Systems' policies are disclosed in Note 2 to the financial statements. — There were no changes in the selection of accounting policies from prior years.	**Qualitative aspects** — We did not identify indication of significant elements of management bias when reviewing these policies.

Significant accounting estimates

Description of significant accounting estimates

— The calculation of the Total Pension Liabilities and Total OPEB liabilities are considered significant estimates

Audit findings

Management's process used to develop the estimates

— The ARMB has contracted with Buck to assess the Total Pension and Total OPEB Liabilities based on actuarial methods described in GASB Statements No. 67 and 74 and assumptions adopted by the ARMB.

Significant assumptions used that have a high degree of subjectivity

— Rate of return

— Mortality rates

— Retirement rates

— Termination rates

Indicators of possible management bias

— None

Conclusions

— The assumptions used were reasonable and supported

— The financial statement disclosures related to the Total Pension and Total OPEB liabilities are consistent with prior years and do not have any indication of management bias.

Other information

Other information	Procedures performed	Results
PERS, TRS and State of Alaska CAFRs	We will review the CAFRs when they are available for consistency with the financial statements and footnotes.	There have not historically been any material inconsistencies identified that require revision.

Questions?

For additional information and audit committee resources, including National Audit Committee Peer Exchange series, a Quarterly webcast, and suggested publications, visit KPMG's Audit Committee Institute (ACI) at www.kpmg.com/ACI

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ALASKA RETIREMENT MANAGEMENT BOARD

Risk and Return in the Current Market Environment

December 2020

Zachary Hanna, CFA
Chief Investment Officer

Key Board Decisions

Determine Investment Objective

- Fund's Purpose
- Governance – who makes which decisions?

Determine Asset Allocation

- Strategic
- Tactical

Oversee Implementation

- Manager Structure – number and types of manager allocations
- Manager Selection

Monitor Results

- Are the fund, asset classes and mandates performing as expected?
- Are they achieving objectives?

Overview

- Guiding Investment Principles
- Portfolio Starting Point
- Market Conditions
- Approaches to Asset Allocation – Starting the Discussion
- Staff Approach and Timeline

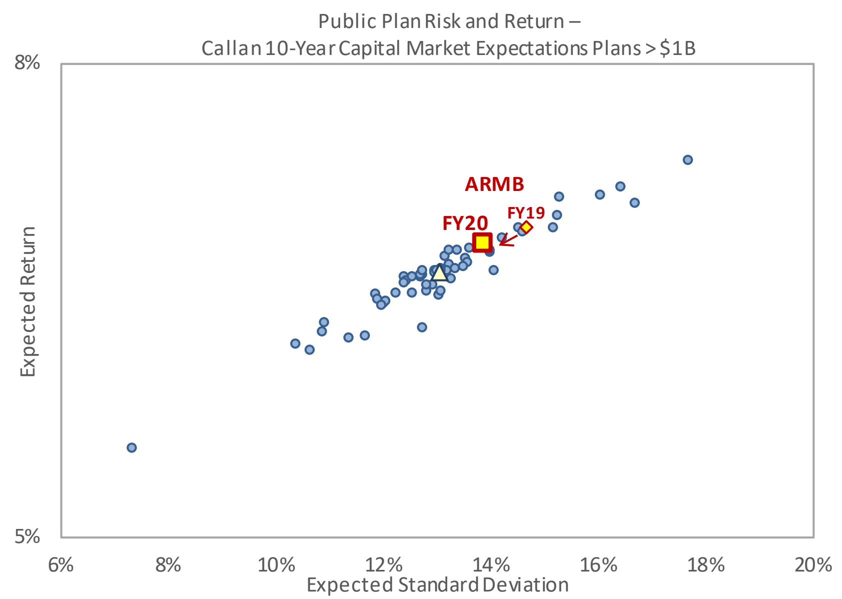
Guiding Investment Principles

- Persistent return is compensation for taking some form of risk.
- Diversification can increase return efficiency and mitigate uncertainty.
- Asset allocation is the main driver of risk and return.
- Time horizon and liquidity needs largely determine a fund's ability to bear risk.
- Policy risk and ability to stay the course implicit in investments should be assessed.
- Implementation matters:
  - Managing costs is fundamental
  - Assets should be pooled to diversify cashflows and achieve scale
  - Unnecessary complexity should be avoided

Current ARMB Portfolio

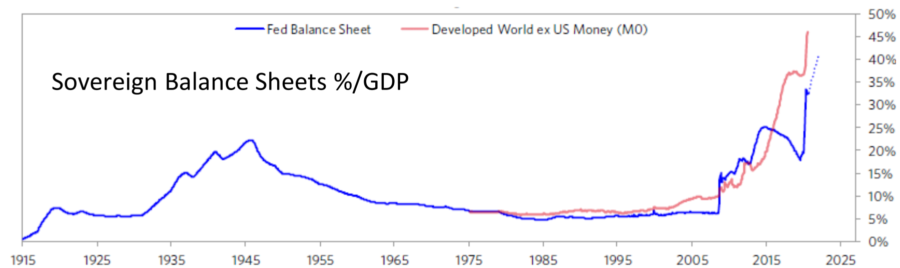
- Equity risk dominates the asset allocation.
- The ARMB has restructured and simplified the portfolio significantly over the past three years, resulting in annual management fee savings of $30 million (~10 bps).
- The equity portfolio is highly structured with significant passive index investments, material exposure to equity risk factors, and limited active management.
- The adopted asset allocation was expected to meet the actuarial return target over a 20-year time horizon.
- The resulting risk posture is above the peer median, but lower than 2019.

Asset Class	Allocation
Broad Domestic Equity	28%
Global Equity Ex-US	19%
Fixed Income	22%
Opportunistic	6%
Real Assets	13%
Private Equity	12%
Total	100%
Expected Return – 20-Year Geometric Mean	7.13%
Projected Standard Deviation	13.55%

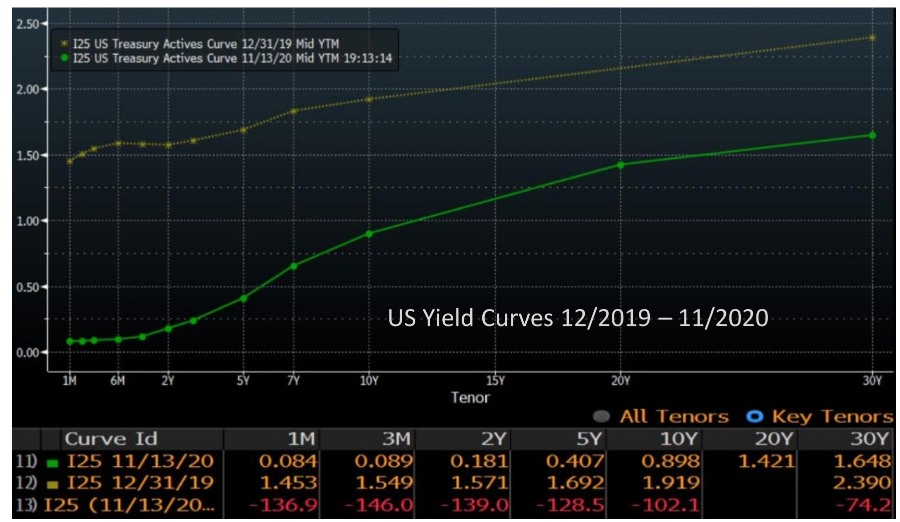


Pandemic, Stimulus, and Interest Rates

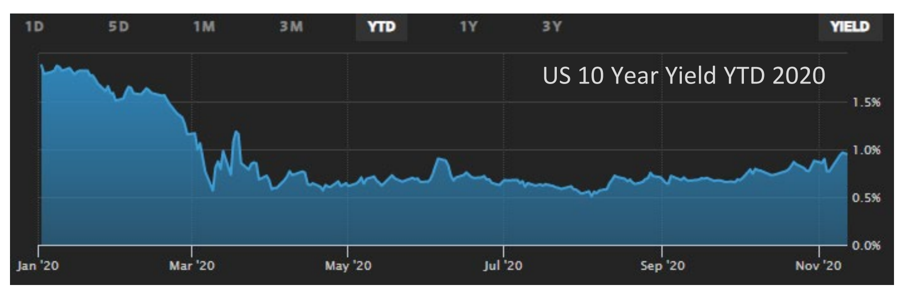
- Rapid and far-reaching fiscal and monetary stimulus has stabilized capital markets and led to all-time low interest rates. All shorter tenors on the yield curve have dropped over 100 basis points.
- The Fed has committed to low rates for the foreseeable future and is willing to allow inflation to move "moderately above" its 2% target "for some time" before raising rates.
- Current bond yields will reduce bond return expectations over the intermediate term and higher debt levels may have a dampening impact on future economic growth.



Bridgewater 12/20 ARMB Presentation



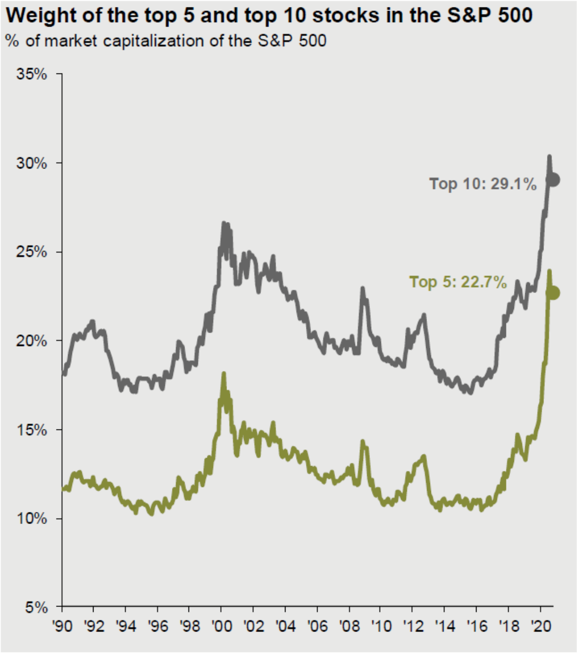
Bloomberg



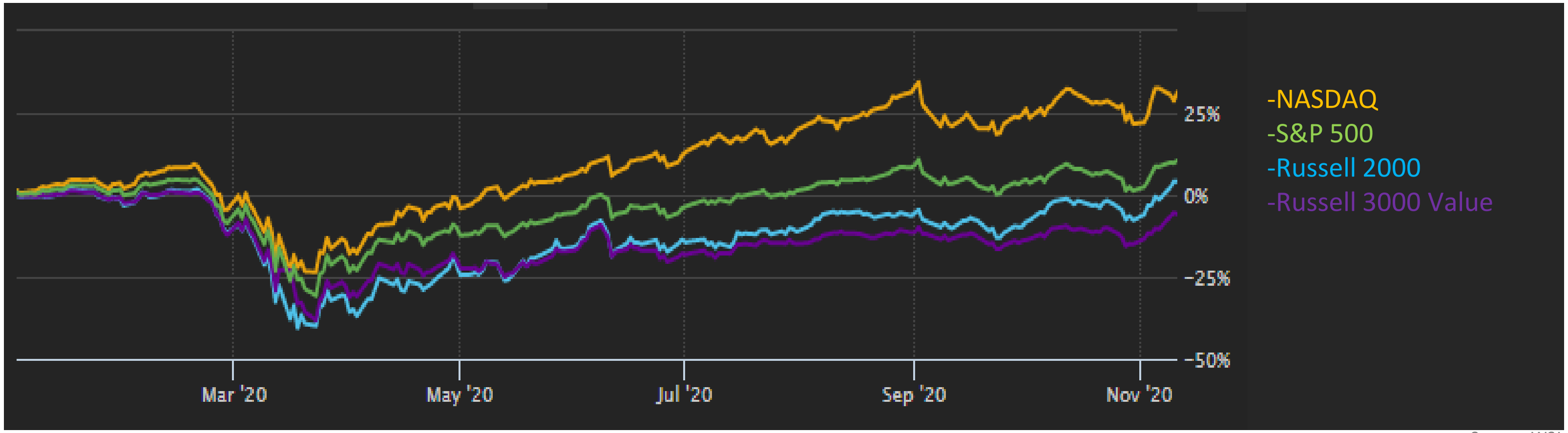
WSJ

Equity Markets and Risk Assets

- Overall, broad market equities have returned to pre-pandemic levels.
- Many other liquid risk assets have recovered as well, particularly those supported by the Fed's asset purchase programs.
- The equity recovery has been concentrated, with less impacted sectors like technology, consumer staples, and healthcare benefiting most.
- There is more widespread economic damage elsewhere in the economy, partially in smaller and more value-oriented companies.



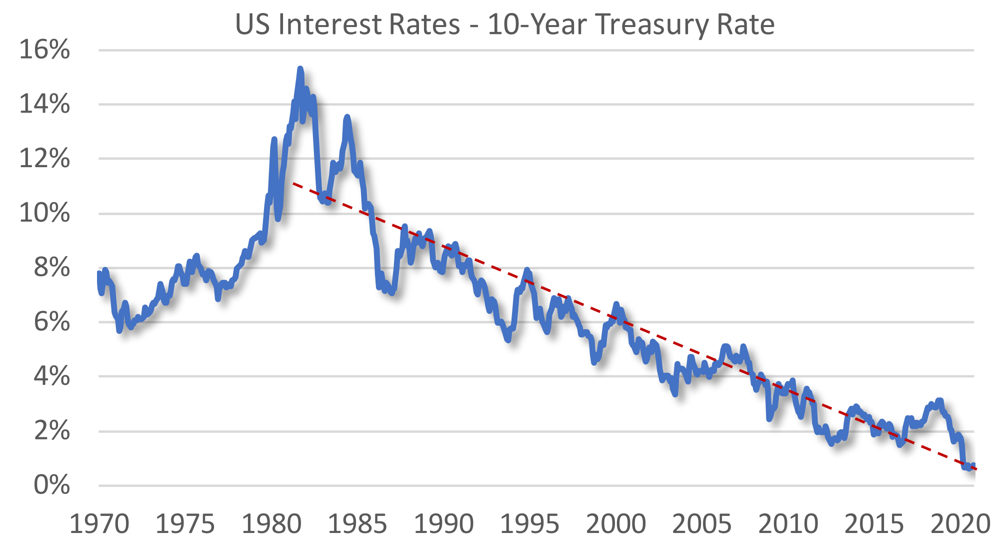
Source: FactSet, Standard & Poor's, J.P. Morgan Asset Management.

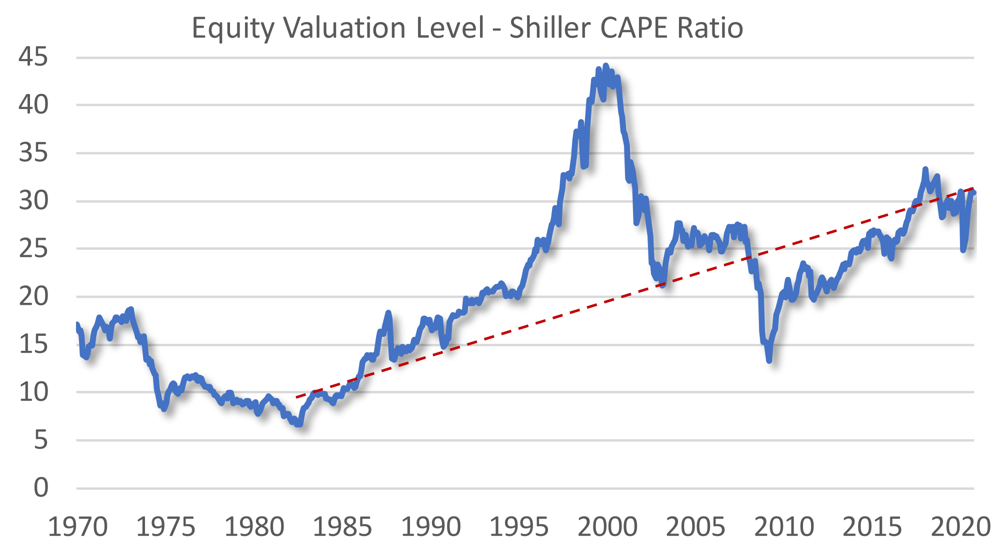


Source: WSJ

Forward Market Conditions

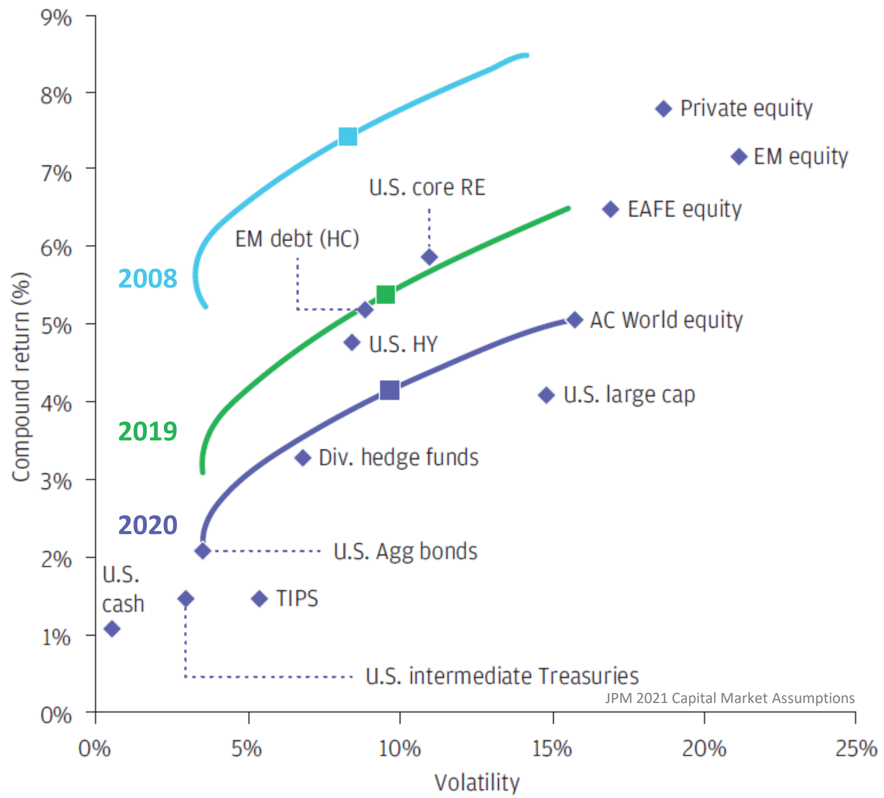
- The pandemic has pushed US Treasuries to near-zero levels, effectively ending the 40-year tailwind of rate reduction for fixed income.
- During this time, fixed income has been a strong equity hedge, while providing high returns and liquidity.
- Equities have also been increasing in valuation, on average, for the past 40 years.
- Both have common root causes led by globalization, productivity, and resulting low inflation.
- The path forward is much less clear with further material rate reduction constrained and potential headwinds for both globalization and growth.





Impact on Capital Market Assumptions

- Callan's 2021 Capital Market Assumptions (CMAs) will be released in January. The ARMB uses a longer-term 20-year set of these assumptions.
- Other market participants have provided a CMA preview with recently released forecasts for shorter time periods.
- Generally, fixed income expected returns are ~100 basis points less than last year.
- Equities are tougher to forecast, but some expect a similar reduction due to elevated valuations, slower future growth, and the lower risk-free rate.
- Overall, staff expects a material ~40-80 bps reduction in expected returns at a similar level of risk over the ARMB's 20-year horizon.



Approaches to the Current Environment

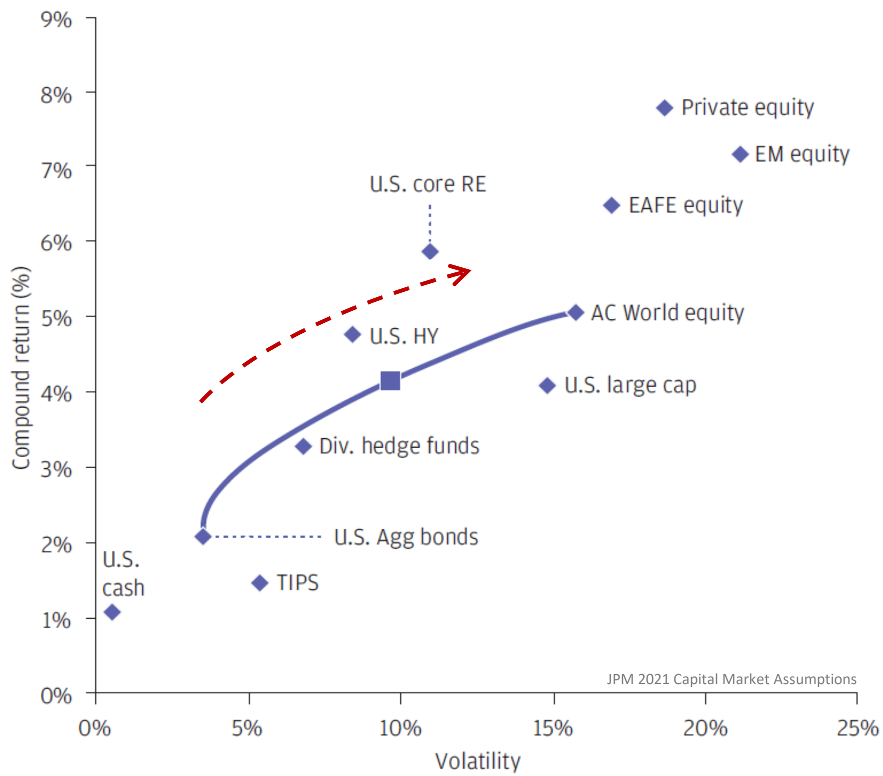
Spectrum of potential asset allocation approaches:

- Increase risk tolerance – move further out the efficient frontier
- Give liquidity – increase private equity, private debt, real assets
- Explore additional beta – precious metals, TIPS, higher-risk bonds, international
- Add alpha
- Further reduce costs
- Add leverage
- Adjust return expectations

Higher <-- Risk/Time --> Lower	Assets	Risks
	Fixed income/Cash	Interest rate/duration/curve structure risk
		Sector risk
		Credit/counterpary risk
		Security Selection
		Liquidity
		Leverage
	Equities	Beta or systematic risk
		Other risk factors
		Active risk/security selection
	Alternatives	Beta or systematic risk
		Liquidity
		Complexity
		Leverage

Increase Risk on Efficient Frontier

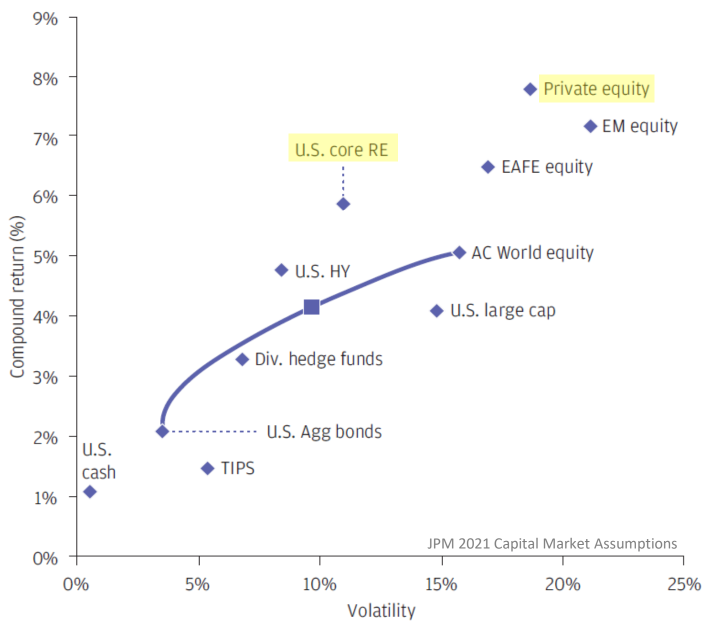
- The ARMB could move further out the efficient frontier – increasing the proportion of higher risk/return assets to increase expected long-term returns.
- Considerations:
  - Increased volatility
  - Downside/tail risk
  - Prudent expert peer comparisons

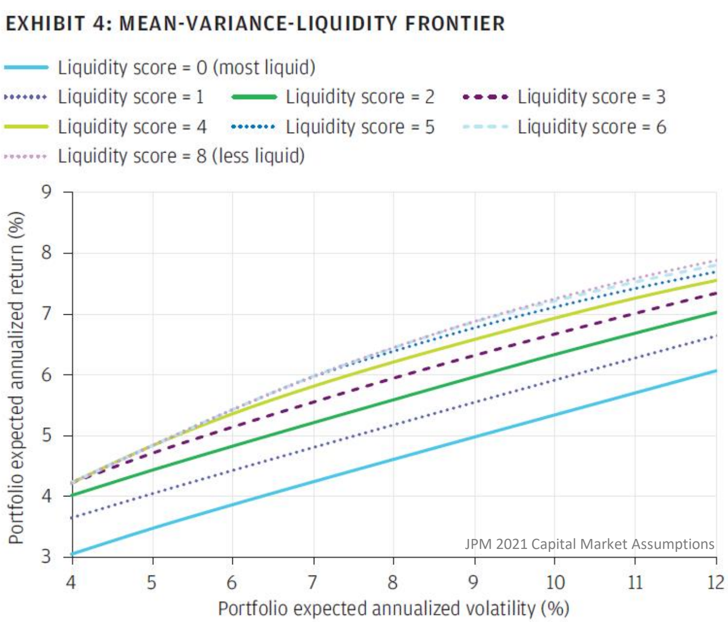


Give Liquidity

- The ARMB could increase exposure to less liquid asset classes like private equity and real assets to target excess returns achieved through a combination of systematic risk, leverage, manager skill, and other factors.

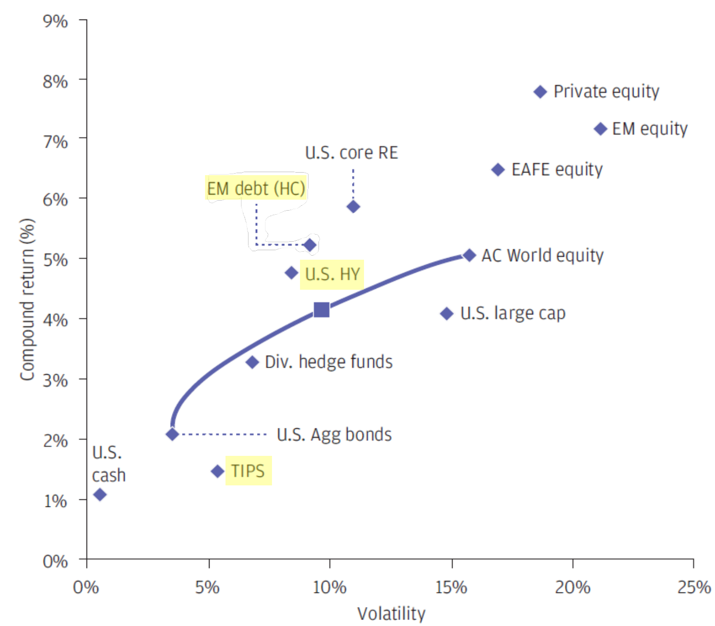
- Considerations:
  - The ARMB has a 13% allocation to real assets, a 12% allocation to private equity, and 3% exposure to private lending investments.
  - The ARMB has some liquidity constraints as a closed, maturing plan.
  - Alternative investments are more expensive, complex, and have additional risks.





Add Additional Beta Sources

- The ARMB could add exposure to other diversifying or return-enhancing assets:
  - Asian stocks and bonds, emerging market debt, and other international fixed income.
  - Inflation hedges like global TIPS and precious metals.
  - High yield bonds, leveraged loans, and other higher-risk U.S. fixed income.
- Benefits:
  - Improve risk efficiency of the funds.
  - Increase upside and reduce downside in certain regimes.
  - Reduce reliance on equity beta.
- Considerations:
  - Additional complexity and potential cost to the portfolio.



Alpha and Cost Reduction

- Alpha/Excess Returns
  - The ARMB could target increased alpha opportunistically and in less efficient areas like international equities, small cap equities, and REITs.
  - Considerations:
    - Alpha/excess returns is difficult to source.
    - Limited capacity and higher fees.
    - Alpha is less than a zero-sum game including fees.

- Target Further Cost Reduction
  - Considerations:
    - The ARMB has already significantly reduced costs.
    - There is often a tradeoff between costs and investment manager skill.

Leverage and Return Expectations

- Leverage
  - The ARMB could use leverage to increase expected returns:
    - Add leverage to existing assets like the ARMB recently did with real estate.
    - Invest in levered assets or strategies like private equity.
    - Add portfolio leverage to increase diversification.
    - Add portfolio leverage to increase risk.
  - Considerations:
    - Leverage increases risk and requires more intensive risk management.
    - Leverage can increase headline or policy risk.
- Adjust Return Expectations
  - Reduce return expectations if there aren't enough acceptable options for risk taking.
  - Short-term expected return deficits.
  - Long-term expected return deficits.

Staff Approach and Timeline

- Staff will approach incremental risk taking by further evaluating:
  - The ARMB risk profile
  - The ARMB liquidity profile
  - Incremental active risks and diversifiers
- January 2021 – Callan releases 2021 Capital Market Assumptions
  - Staff to provide the CMA’s to ARMB Trustees early
- March 2021 ARMB Meeting
  - Capital market assumption discussion
  - Liquidity update
  - Downside risk update
  - Consideration of potential new portfolio strategies
- June 2021 ARMB Meeting
  - Adopt asset allocation

Questions?

ALASKA RETIREMENT MANAGEMENT BOARD

Private Equity Annual Tactical Plan

Staff Summary and Overview

Sean Howard, CFA
State Investment Officer

Key Board Decisions

Determine Investment Objective

- Fund's Purpose
- Governance – who makes which decisions?

Determine Asset Allocation

- Strategic
- Tactical

Oversee Implementation

- Manager Structure – number and types of manager allocations.
- Manager Selection

Monitor Results

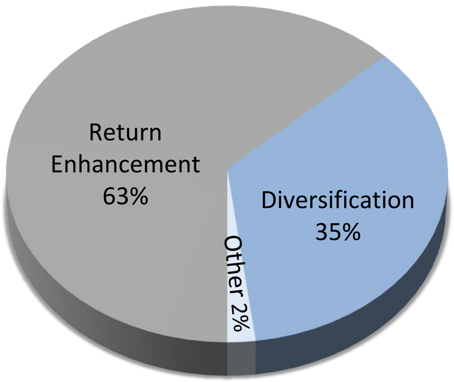
- Are the fund, asset classes and mandates performing as expected?
- Are they achieving objectives?

ARMB Private Equity Program

- Private Equity Overview
- Market Review
- ARMB Portfolio
- 2019 Commitments
- Pacing Model
- Plan Recommendation
- Summary

Overview – Private Equity Investment

- Why do fund sponsors invest in private equity?



Source: Goldman Sachs

- Private equity is expected to deliver long-term returns in excess of the public markets.

Annualized Returns as of June 30, 2020

Investment Type	5 Year	10 Year	20 Year
Cambridge - All Private Equity	10.1%	13.0%	9.5%
Public Equity	5.8%	10.2%	5.3%
Difference	**4.3%**	**2.8%**	**4.2%**

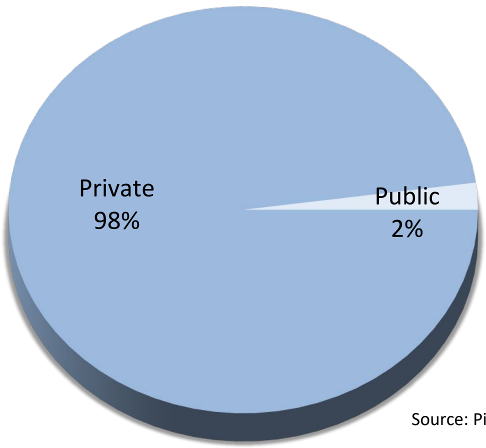
Source: Refinitiv/Cambridge Associates. Private equity returns are pooled IRR's across all regions and do not represent top quartile returns. The public equity return is an equally weighted blend of the S&P 500, Russell 2000, and MSCI EAFE and is a time-weighted return (TWR) which is not directly comparable to an internal rate of return (IRR).

Overview – Unique Characteristics

- Positive Characteristics:
  - Larger, more diverse investment universe
  - Less efficient companies – opportunity to create value
  - Less efficient markets – pricing opportunities
  - Control and alignment of interests
  - Managed for long-term value

- Other Characteristics:
  - Illiquid, long-term investments
  - High fees and J-curve
  - Potential for high leverage
  - Portfolio transparency and valuation issues
  - Incomplete data and benchmarks

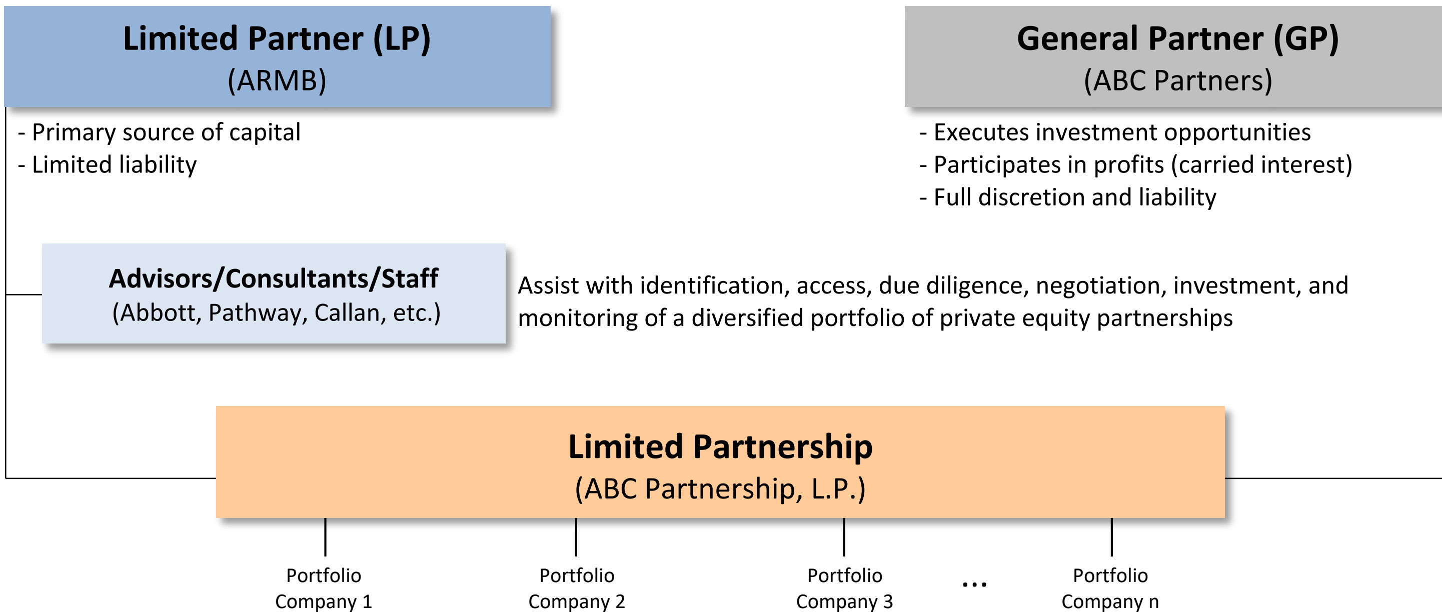
Public and Private Companies



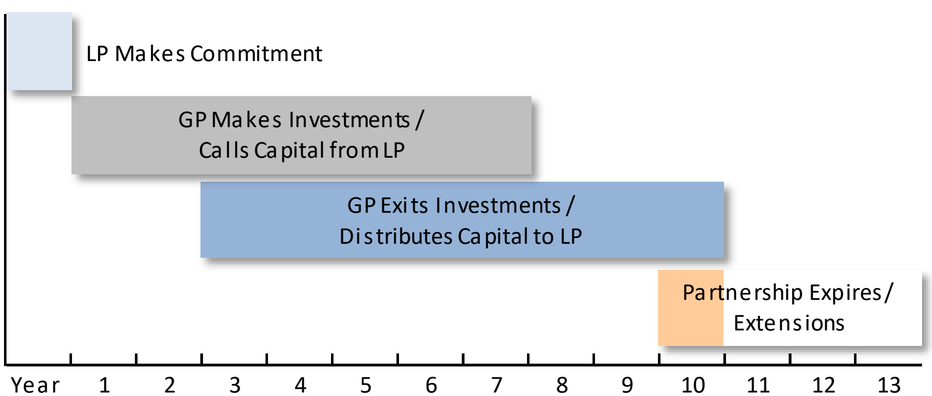
Source: Pitchbook

Overview – Structure

- Private equity investments are typically made through limited partnerships:



- Private equity liquidity and cash flow characteristics:



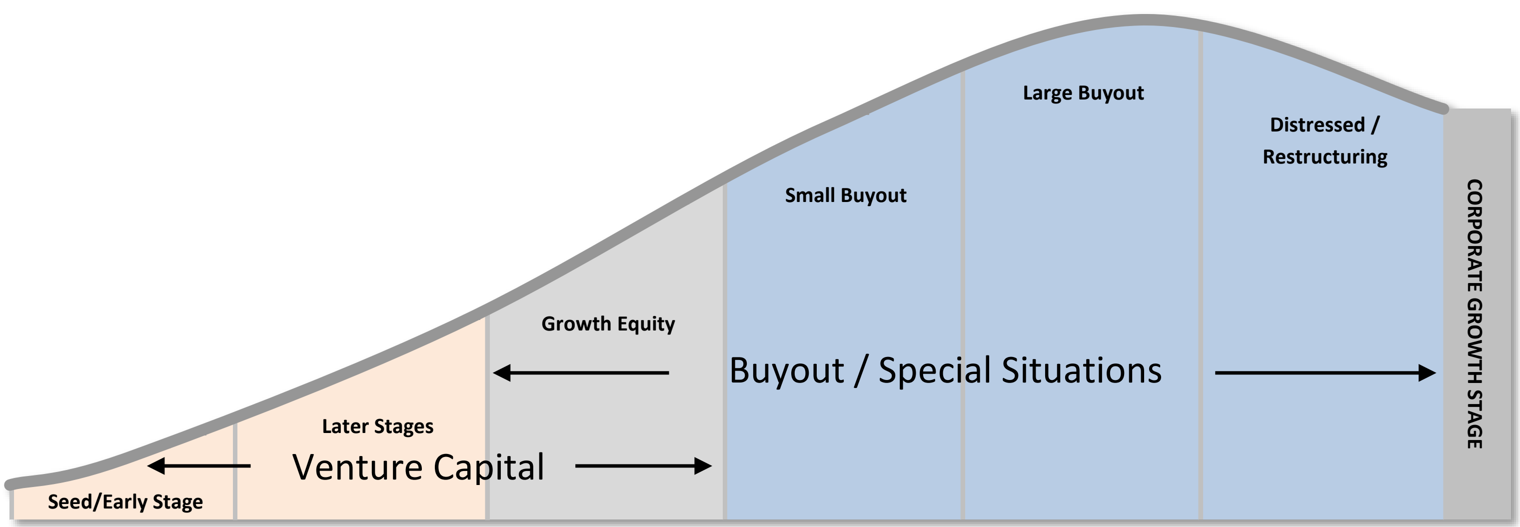
Overview – Primary Strategies

Private equity partnerships are classified into three primary groups:

Venture Capital Investments in companies developing new products and services. Value creation focuses on managing entrepreneurial companies through high growth.

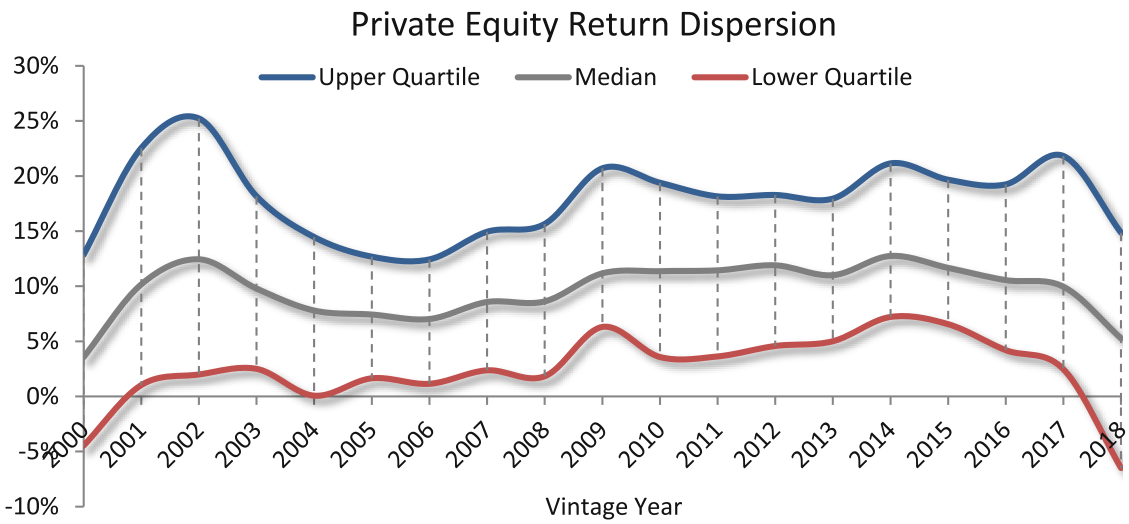
Buyout Control investments in more mature operating companies. Value creation generally focuses on driving operational and capital structure efficiency.

Special Situations Generally buyout style investments with a specialty focus; including groups that have a specific industry, investment style, or capital structure focus. Value creation focuses on specialized skills and efficiency.



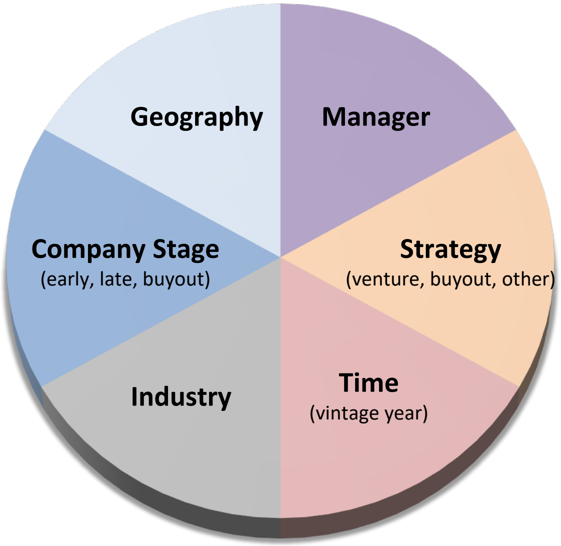
Overview – Program Implementation

- Wide performance dispersion leads to opportunities but also makes manager access, selection, and due diligence critical. Consistently investing with high quality managers is key.



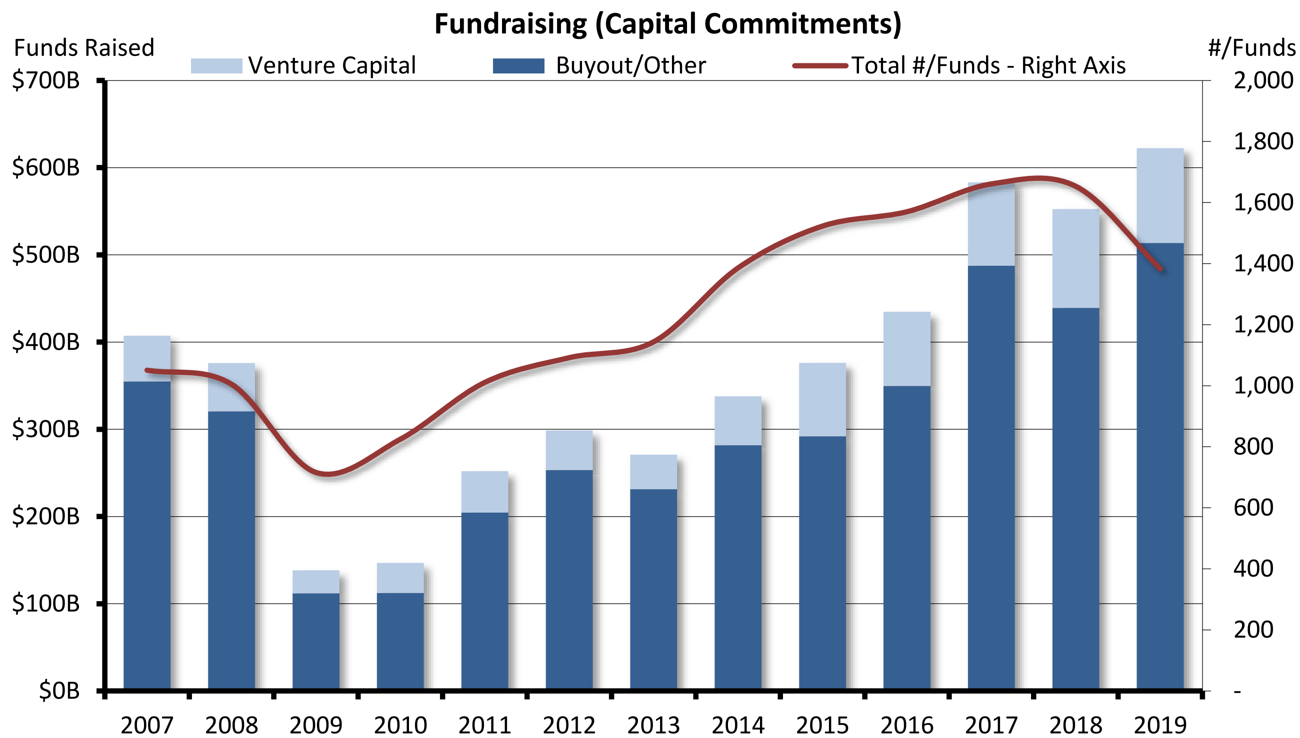
Source: Refinitiv/Cambridge as of June 30, 2020

- The goal is to build a portfolio of quality partnerships diversified by strategy, industry, geography, company stage, manager, and time.



Market – Fundraising

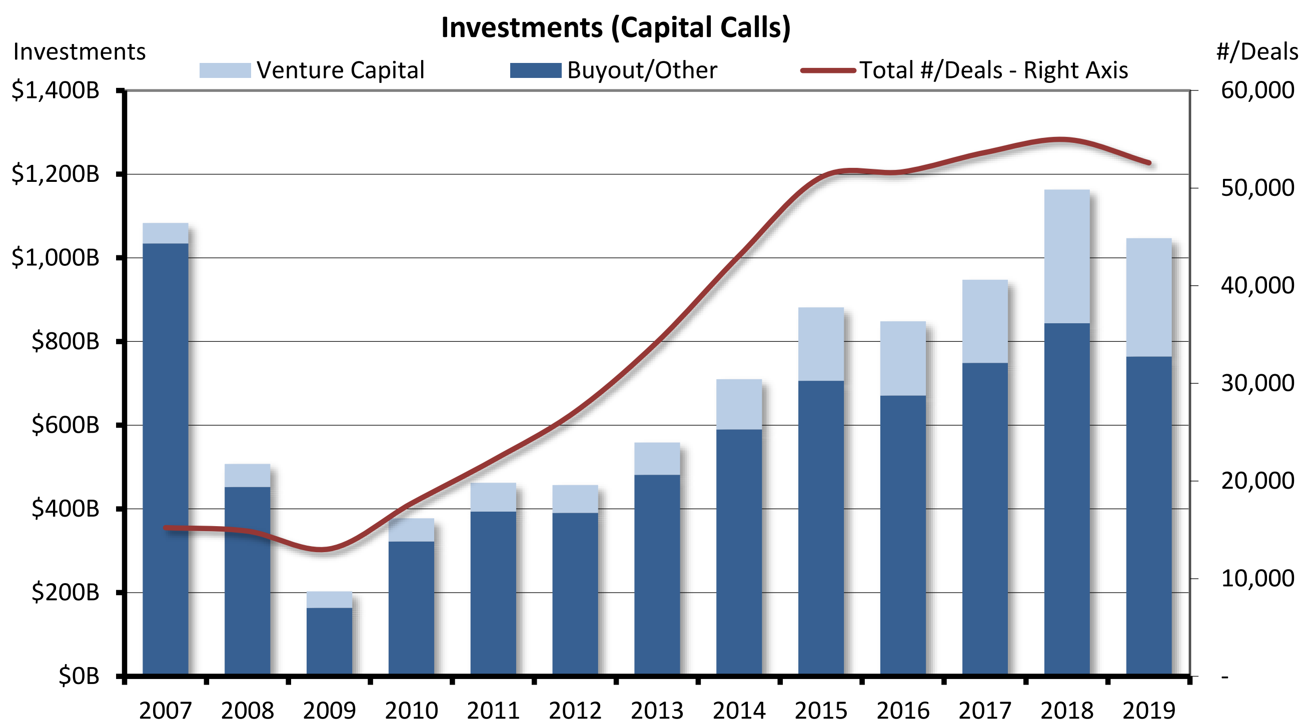
- Fundraising in 2019 resumed an upward trajectory after a temporary decline in the prior year.
- Despite the pandemic, fundraising in 2020 has been strong.
- Terms will likely continue to be GP-friendly as demand for private equity increases, with funds closing relatively quickly.



Source: Pitchbook

Market – Investing

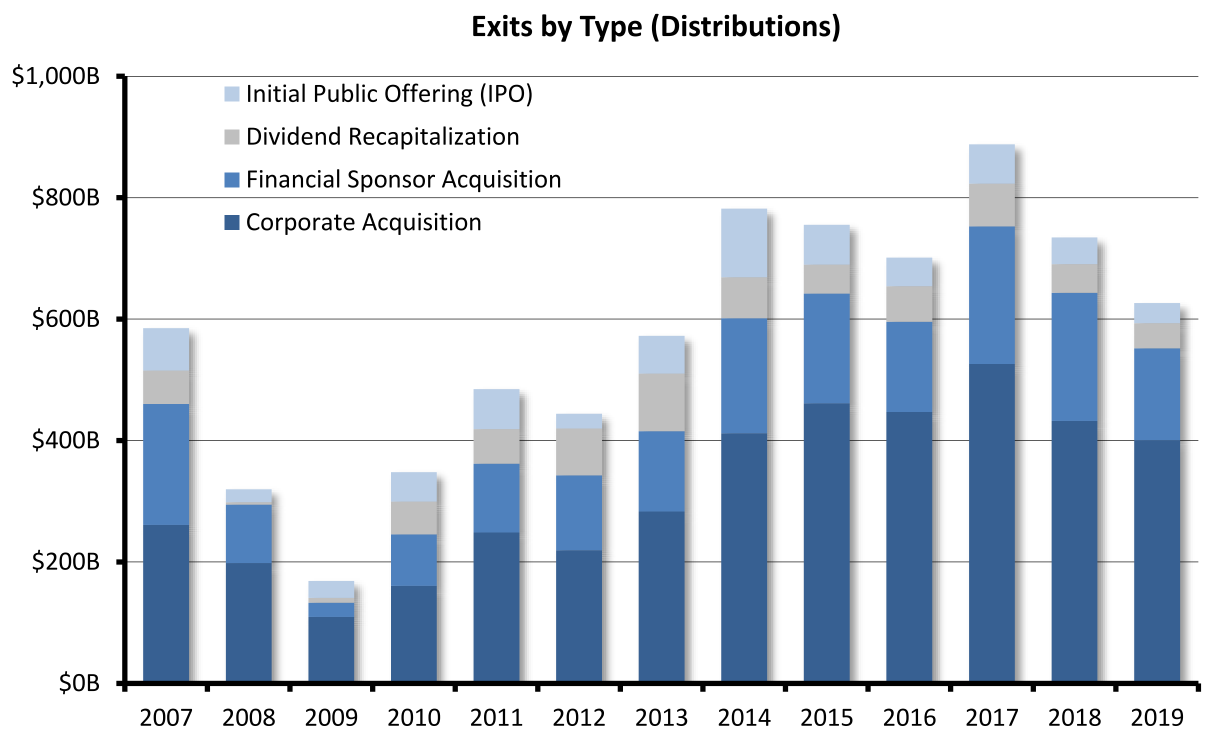
- Investment activity declined from the prior year's high but remains elevated as capital continues to flow into private equity.
- U.S. buyout deal pricing rose above 11x EBITDA in 2019.
- Leverage multiples saw an increase in 2019 but have since retreated as market participants seek more conservative deal structuring during economic uncertainty.



Sources: Pitchbook, S&P Global

Market – Exit Opportunities

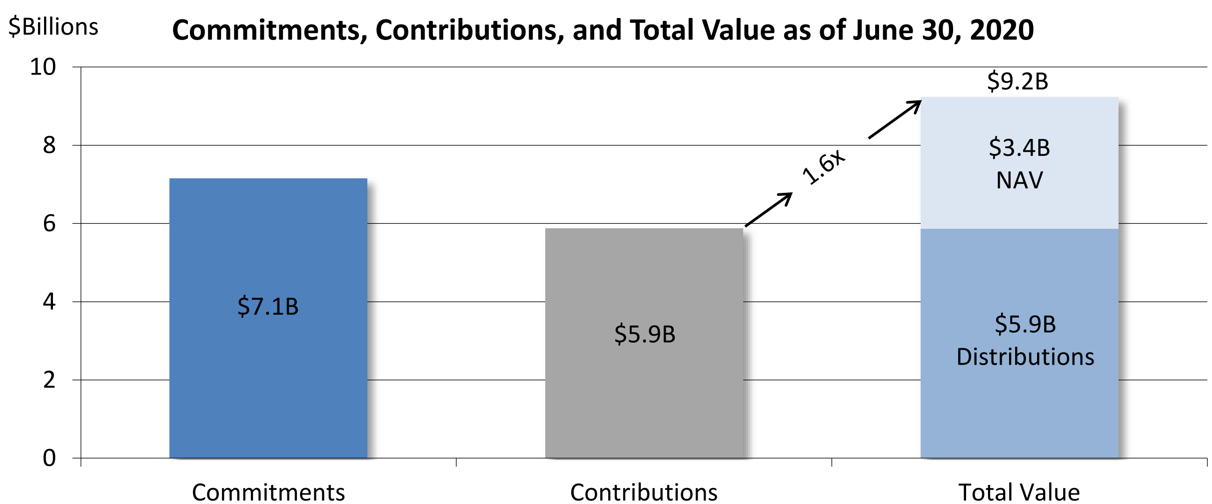
- Private equity exit activity in 2019 continued its recent decline from 2017 highs.
- Corporate and sponsor-backed acquisitions remain the most common exit routes.
- Special purpose acquisition companies (SPACs) have grown significantly and are increasingly being recognized as a viable source of liquidity.



Source: Pitchbook. Data does not include VC exits. Global developed markets, except dividend recapitalization data which is U.S. only.

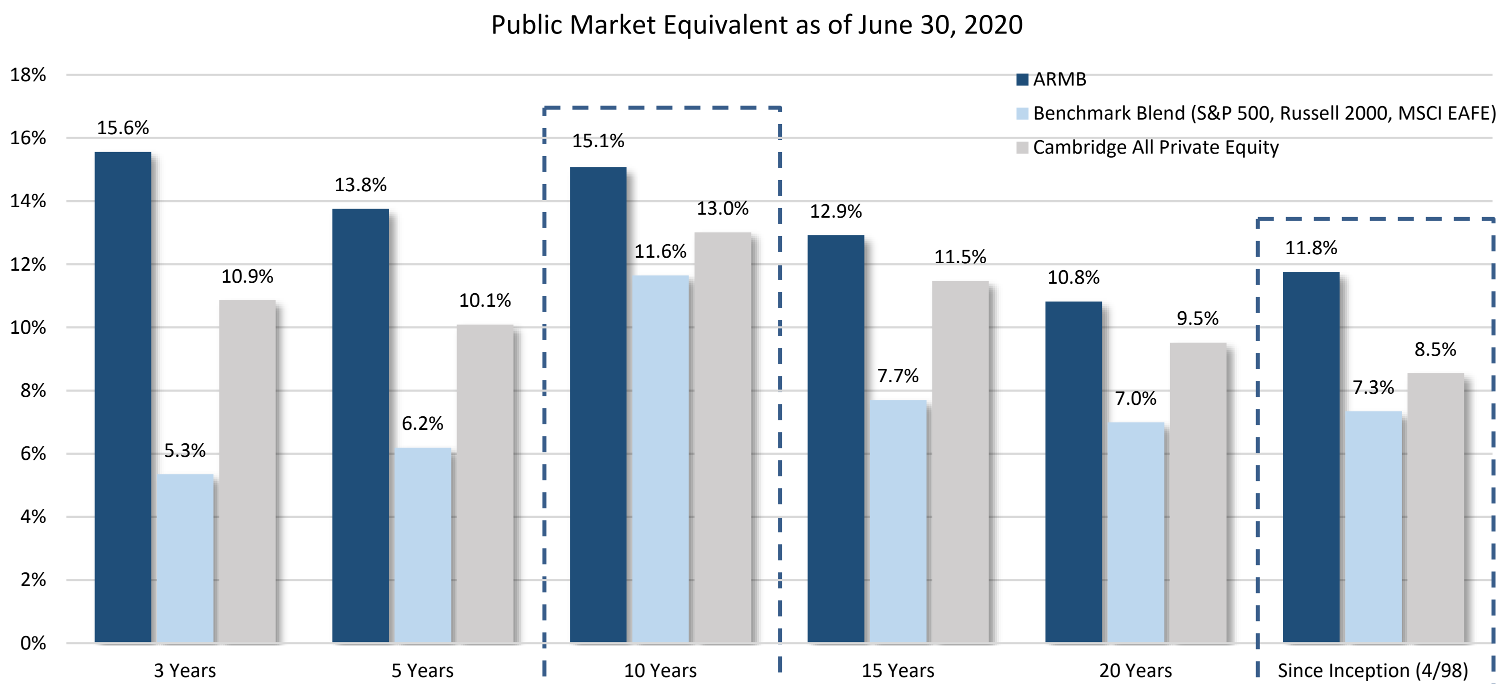
ARMB Portfolio Performance

- The ARMB directly invests in private equity and uses gatekeepers, Abbott Capital Management (1998) and Pathway Capital Management (2001). The asset allocation began at 3% and has increased over time to the current level of 12%.
- ARMB and its advisors have built a diversified portfolio of quality partnerships. Manager selection has been strong. The program is in the 40th percentile with an 11.8% internal rate of return (IRR) compared with the Cambridge median of 8.5%.
- The ARMB has four vintage years in the first quartile, one in the third quartile, and the remaining in the second quartile.
- Overall, the total value of the ARMB private equity portfolio is 1.6x invested capital.
- The 10-year time-weighted return for the private equity portfolio is 15.4% versus 10.2% for the PE benchmark blend (1/3 S&P 500, 1/3 Russell 2000, 1/3 MSCI EAFE).



ARMB Public Market Equivalent (PME)

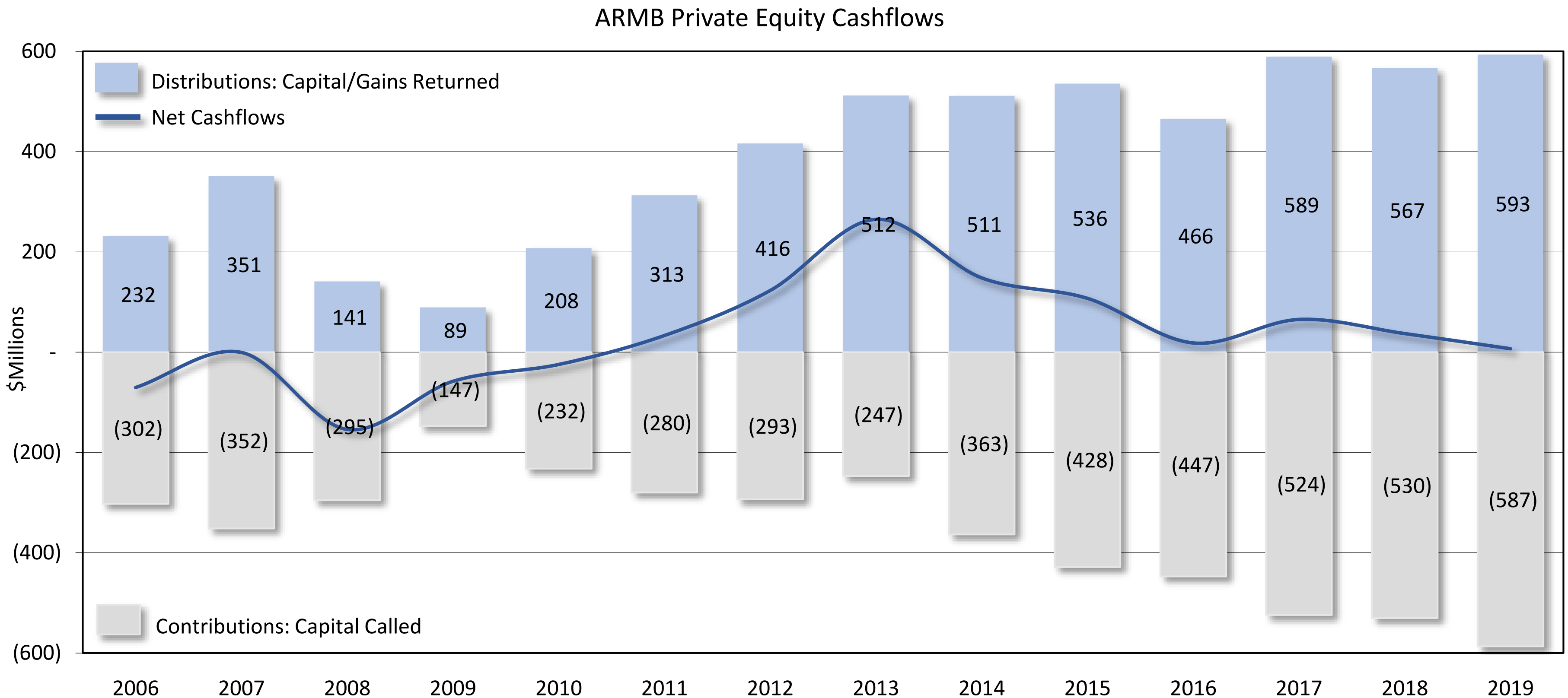
- The ARMB's long-term benchmark for private equity is an equal-weighted blend of the S&P 500, Russell 2000, and MSCI EAFE + 200bps.
- Since inception, ARMB's private equity portfolio has generated an 11.8% internal rate of return (IRR) – outperforming the benchmark blend by 441bps.
- Outperformance has generated $2.1 billion in additional fund value compared to investing in the public equity markets alone.
- Over the past 10 years, the portfolio IRR is 15.1%, a 343bps outperformance over the benchmark PME as small cap and international equities have had poor recent performance.



Source: Refinitiv/Cambridge. Cambridge since inception return only includes vintage years 1998-2020.
Returns are annualized and net of fees.

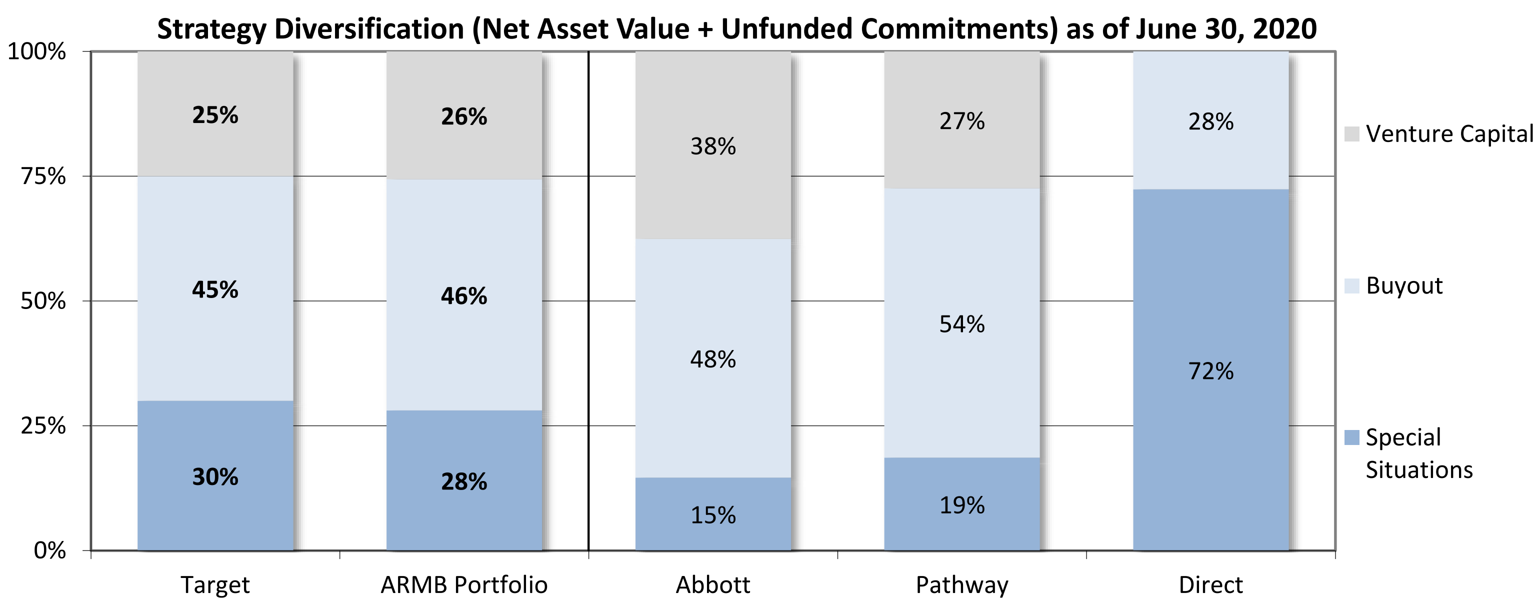
Portfolio Cash Flows

- Net cash inflows over the past five years were $235 million.
- Contributions and distributions remain steady and elevated over recent years as a result of the growth in allocation to private equity and the maturity of the program.



Diversification by Strategy

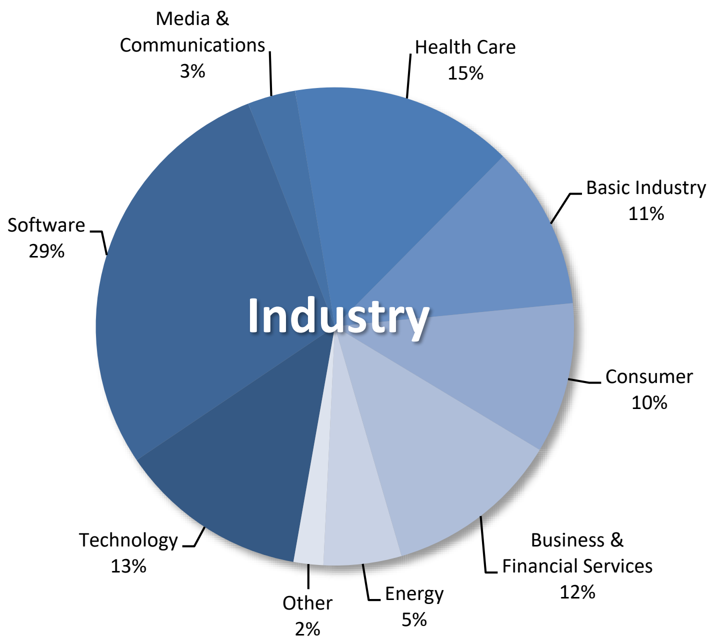
- The portfolio is well-diversified by private equity strategy across venture capital, buyout, and special situations.
- Strategy exposure is within policy bands and near target:
  - Abbott's portfolio is overweight venture capital and they have been decreasing VC investments to lower this exposure.
  - The direct partnership portfolio is weighted towards well-diversified special situations investments and has no direct venture capital exposure due, in part, to overweights in the rest of the portfolio.

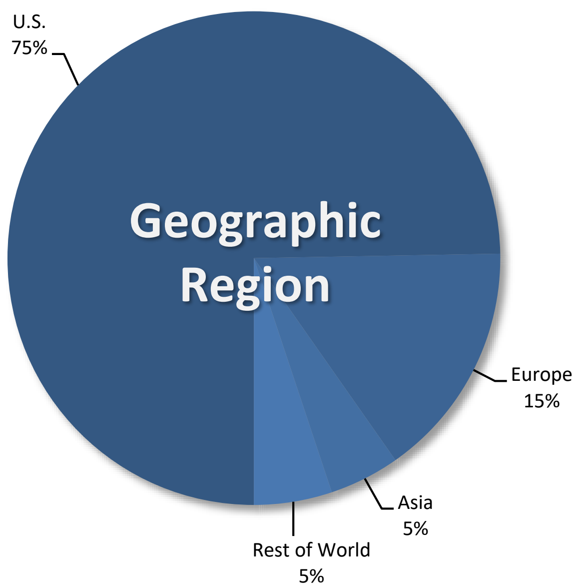


Diversification by Portfolio Company

The portfolio is well-diversified by underlying portfolio companies:

- Industry – Software is now 29% of the portfolio but is inherently diversified to the broader economy since software tools and services are now fundamental to most businesses.
- Geographic Region – International investments account for 25% of the portfolio.





Data as of June 30, 2020

2019 Commitments

- The commitment target for 2019 was $590 million.
- $508 million was committed during the year.
- Pathway's co-investment program made 12 investments totaling $34 million while Abbott made three co-investments totaling $13 million.
- Commitments were diversified by investment strategy, with lower venture capital commitments due to the existing portfolio overweight.

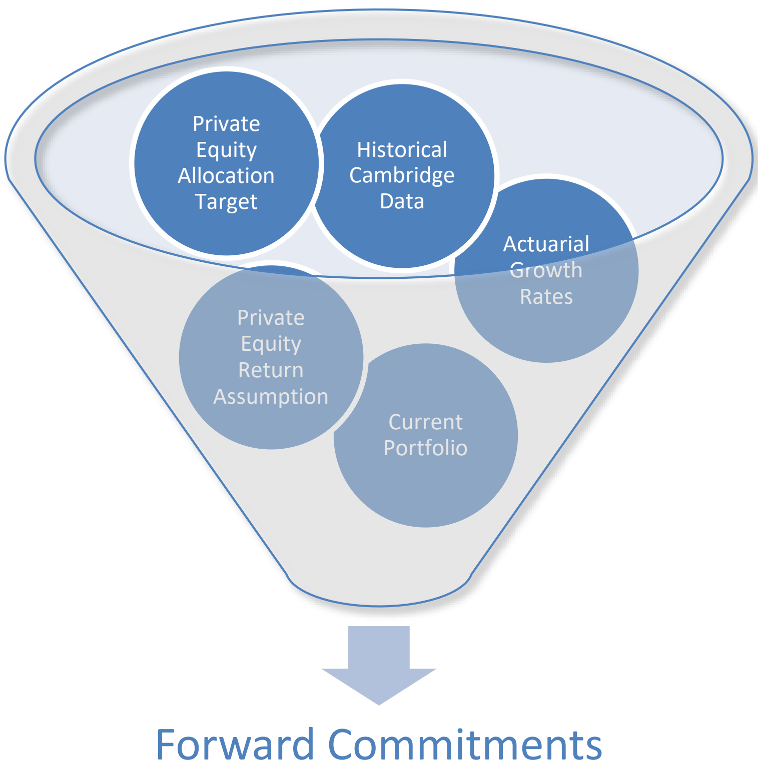
Commitments for 2019 ($millions)

Manager	Target	Actual	Number of Investments	Investment Strategy					
				Venture	%	Buyout	%	Special Situations	%
Abbott	$210	$191	17	$10	5%	$138	73%	$42	22%
Pathway	$210	$222	28	$27	12%	$134	60%	$62	28%
Direct	$170	$95	3	$0	0%	$30	32%	$65	68%
Total	**$590**	**$508**	**48**	**$37**	**7%**	**$302**	**60%**	**$169**	**33%**

- Commitments in 2020 are expected to be close to the target of $600 million.

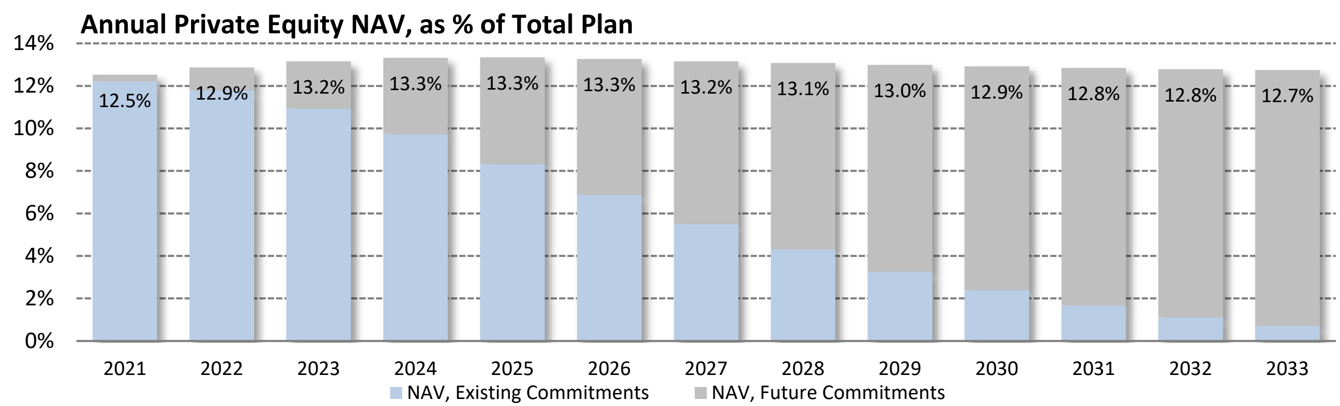
Pacing Model

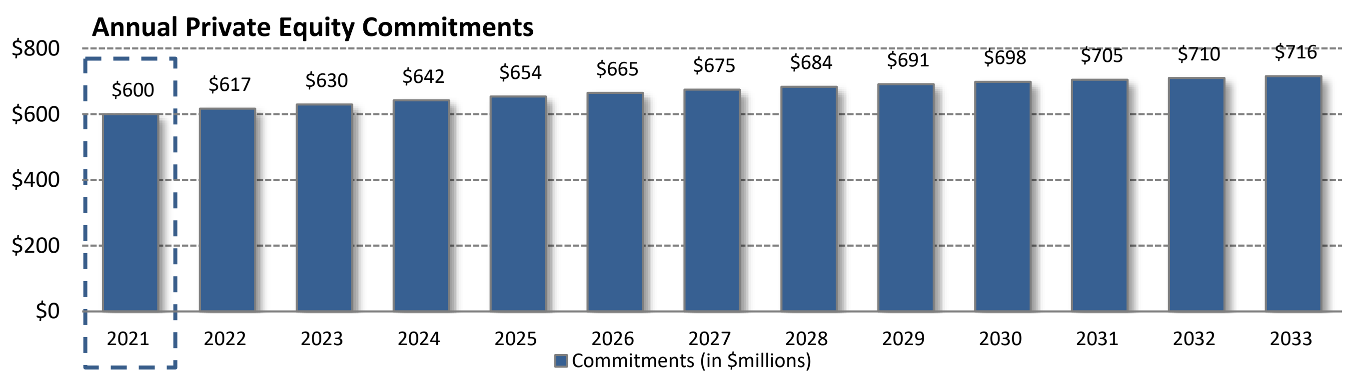
- Staff uses a pacing model to project the forward commitments needed to achieve ARMB's targeted allocation to private equity.
- The illiquid nature and cash flow characteristics of private equity necessitate a forward projection to guide the portfolio towards the target allocation over time.
- Considerations:
  - Denominator effect: sharp declines in liquid asset classes result in over-allocations to illiquid asset classes.
  - Annual commitment decisions are long-term decisions.
  - Vintage year diversification



Commitment Pacing Recommendation

- ARMB's current long-term allocation target for private equity is 12%.
- Staff recommends a 2021 commitment target of $600 million, split equally between Abbott, Pathway, and direct partnership investments.
- The pacing model uses 6/30/20 starting values which show an overweight to private equity, but plan assets have since rebounded and reduced this overweight. Staff does not recommend reducing the long-term commitment pacing at this point.





Summary

- Private equity plays a critical role in achieving the plan's return target.
- The flow of capital into private equity will likely impact forward returns but staff expects private equity to continue to deliver a meaningful return premium over public markets.
- ARMB has a strong private equity program with performance that has had a significant positive impact on the plan.
- Staff continues to evaluate ways to improve the program with a focus on return/cost efficiency.

Appendix A:
2019 Commitments – Buyout 1 of 2

Strategy	Partnership Fund	Description	Amount	% Total	Date	Manager
Buyouts	Advent International GPE IX	Control-oriented buyouts in middle-and large-market companies, primarily in Europe and North America	$15.0	3.0%	5/23/19	Abbott
	Advent International GPE IX	Control-oriented buyouts in middle-and large-market companies, primarily in Europe and North America	$30.0	3.7%	4/30/19	Direct
	Advent International GPE IX	Control-oriented buyouts in middle-and large-market companies, primarily in Europe and North America	$15.0	3.0%	5/9/19	Pathway
	AEA Investors Fund VII	Control investments across several industries including value-added industrial products and services, specialty chemicals, consumer products and business services	$15.0	3.0%	2/8/19	Abbott
	BlackFin Financial Services Fund III	Control investments in lower mid-market investments in financial services companies, primarily based in Continental Europe with a particular focus on France, Germany and the Benelux	$15.1	3.0%	7/19/19	Abbott
	Blizzard	Co-investment alongside Centerbridge Capital III in a provider of direct-to-consumer sales, marketing, and customer service solutions for health insurance providers through a diversified online platform	$4.0	0.8%	9/13/19	Pathway
	Catalog Holdco	Co-investment alongside Permira VII in a contract development and manufacturing organization that provides drug substance, drug product, and analytical services	$1.1	0.2%	12/3/19	Pathway
	Charlesbank Tech Opportunities Fund	Focus on thematic investing in enterprise software, cybersecurity, healthcare IT, industrial technology, cloud computing & internet infrastructure, internet & e-commerce, technology-enabled services and data & analytics	$15.0	3.0%	7/12/19	Abbott
	Dragon Co-Invest	Co-investment alongside Clearlake IV and Clearlake V in a provider of identity authentication encryption solutions for the web and the Internet of Things	$2.0	0.4%	9/17/19	Pathway
	EM Eagle	Co-investment alongside Thoma Bravo XIII in a provider of a cloud-based software platform for the mortgage finance industry	$4.0	0.8%	4/17/19	Pathway
	Flexpoint Fund IV-A	Buyout investments in financial services and healthcare	$10.7	2.1%	7/2/19	Abbott
	Flexpoint Overage Fund IV-A	Overage fund for Flexpoint Fund IV-A	$3.6	0.7%	7/2/19	Abbott
	Genstar IX	Control investments in growth-oriented middle-market companies in North America primarily in the financial services, healthcare, industrial technology and software sectors	$15.0	3.0%	2/21/19	Pathway
	Giants Co-invest	Co-investment alongside Summit GE IX and Summit GE X in a vertically integrated Medicare Advantage health plan and care-delivery provider in Puerto Rico and Florida	$4.0	0.8%	7/16/19	Pathway
	Gilde Buy-Out Fund VI	Control midmarket investments in the Benelux and German-speaking countries	$15.1	3.0%	6/28/19	Abbott
	Green Equity Investors VIII	Upper-middle market buyout investments in consumer/retail, healthcare services/wellness, distribution, business services, and industrials.	$15.0	3.0%	10/18/19	Abbott
	Grove Co-Investor	Co-investment alongside Mayfair II in a UK-based provider of private, premium-priced schooling and education services	$4.0	0.8%	7/24/19	Pathway

Appendix A:
2019 Commitments – Buyout 2 of 2

Strategy	Partnership Fund	Description	Amount	% Total	Date	Manager
Buyouts	GTCR (AP) Investors	Co-investment alongside GTCR XII in a North American property and casualty insurance broker	$1.9	0.4%	4/26/19	Pathway
	GTCR (AP) Investors	Co-investment alongside GTCR XII in a North American property and casualty insurance broker	$5.0	0.4%	5/6/19	Abbott
	H&F Unite	Co-investment alongside H&F VIII & IX in a SaaS provider of cloud-based human capital management and employee experience solutions	$2.1	0.4%	5/1/19	Pathway
	HIG Middle Market LBO III	Control and influential minority investments in middle-market companies operating primarily in the U.S. in a variety of industries	$7.4	1.5%	7/23/19	Pathway
	IG True Grit	Co-investment alongside Harvest VII and Harvest VIII in a provider of employment and staffing solutions to customers in the U.S. and Canada	$4.0	0.8%	10/1/19	Pathway
	Insight RF Holdings	Co-investment alongside Insight X in a provider of SaaS-based cyberthreat intelligence solutions	$1.8	0.4%	7/3/19	Pathway
	Insight RF Holdings	Co-investment alongside Insight X in a provider of SaaS-based cyberthreat intelligence solutions	$3.0	0.4%	7/3/19	Abbott
	Madison CP VIII	Control- and non-control investments in middle- and upper-middle-market companies in the U.S. primarily in the technology, business services, financial services, and healthcare sectors	$15.0	3.0%	10/11/19	Pathway
	Mattco Forge	Co-investment alongside Blue Point IV in a leading manufacturer of engineered forged-metal products	$3.8	0.7%	12/6/19	Pathway
	Nautic IX	Middle-market buyout investments in North America in the outsourced business services, industrial products, and healthcare sectors	$10.4	2.0%	3/12/19	Pathway
	Parthenon Investors VI	Lower middle-market buyout investments in financial services, healthcare services, and business services companies	$11.0	2.2%	12/5/19	Abbott
	Permira VII	Control- and non-control-oriented investments in upper-middle-market companies in Europe and North America in various sectors	$15.1	3.0%	6/11/19	Pathway
	ShoreView IV	Control-oriented investments in lower middle-market companies in the United States primarily in the manufacturing, distribution, industrials, and business services sectors	$7.5	1.5%	6/3/19	Pathway
	TA XIII	Global growth equity and buyout investments in technology, business and financial services, consumer and healthcare.	$15.0	3.0%	5/2/19	Abbott
	Trident VIII (Stone Point)	Control- and non-control-oriented investments in middle-market financial services companies	$15.0	3.0%	5/25/19	Pathway
	White Cypress Co-Invest	Co-investment alongside Clearlake V, COP I, and COP II in a provider of real-time data management and analytics software	$1.0	0.2%	5/30/19	Pathway
	Buyout Subtotals		***$302.3***	***59.5%***		

Appendix A:
2019 Commitments – Venture and Special Situations

Strategy	Partnership Fund	Description	Amount	% Total	Date	Manager
Venture Capital	NEA 17	Early-to-late stage equity investments in information technology and healthcare companies primarily in the U.S.	$15.0	3.0%	6/6/19	Pathway
	Oak HC/FT Partners III	Early and growth stage investments in fintech and healthcare companies primarily in North America	$10.0	2.0%	7/31/19	Abbott
	Project Ocean	Secondary investment in Battery IX, which focuses on technology investments across a broad range of industry subsectors and stages of development	$7.5	1.5%	6/30/19	Pathway
	Project Target	Secondary investment in Canaan VIII, IX, X, and XI, which focus on early stage investments in technology and healthcare companies	$4.3	0.8%	7/1/19	Pathway
	Venture Capital Subtotals		***$36.8***	***7.2%***		
Special Situations	Clearlake Capital Partners VI	Control-oriented investments in middle-market companies in the U.S. primarily in the technology, software, industrials, and consumer sectors	$14.0	2.8%	12/10/19	Abbott
	Clearlake Capital Partners VI	Control-oriented investments in middle-market companies in the U.S. primarily in the technology, software, industrials, and consumer sectors	$30.0	3.3%	12/5/19	Direct
	Clearlake Capital Partners VI	Control-oriented investments in middle-market companies in the U.S. primarily in the technology, software, industrials, and consumer sectors	$15.0	3.0%	12/10/19	Pathway
	Great Hill Equity Partners VII	Predominantly control investments in high-growth, middle-market businesses in four verticals: Internet infrastructure, digital media and vertical software; financial software and payments; healthcare IT and services; and eCommerce, consumer, and marketing technology.	$13.3	2.6%	6/28/19	Abbott
	GTCR (CP-1) Investors	Co-investment alongside GTCR in a manufacturer of lab testing equipment.	$5.1	1.0%	10/18/19	Abbott
	Insight Continuation	Secondary investment led by Insight involving 32 portfolio companies and other assets held by seven funds: Insight IV, Insight V, Insight VI, Insight VII, Insight Co II, Insight VIII, and Insight Co III	$9.0	1.8%	8/14/19	Pathway
	Insight Partners XI	Insight invests globally in venture, minority growth, buyout, and management startup transactions in leading high growth software companies, with a smaller opportunistic focus on the internet and consumer products sectors.	$10.0	2.0%	12/17/19	Abbott
	Project Packer	Secondary investment in EnCap Flatrock III and IV, which target control-oriented investments in midstream oil and gas companies and projects	$7.7	1.5%	3/31/19	Pathway
	Summit GE X	Control- and non-control-oriented expansion, recapitalization, and buyout investments in U.S.-based companies	$15.0	3.0%	2/26/19	Pathway
	Summit GE X	Control- and non-control-oriented expansion, recapitalization, and buyout investments in U.S.-based companies	$35.0	3.3%	2/15/19	Direct
	TA XIII	Growth-oriented buyout and minority investments in technology, healthcare, and financial services companies, primarily in the U.S. and Europe	$15.0	3.0%	5/2/19	Pathway
	Special Situations Subtotals		***$169.1***	***33.3%***		
Abbott Subtotal			**$190.8**	**37.5%**		
Pathway Subtotal			**$222.5**	**43.8%**		
Direct Subtotal			**$95.0**	**18.7%**		
TOTAL ($MM)			**$508.3**	**100.0%**		

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Private Equity Annual Tactical Plan	ACTION:	X
	Resolution 2020-18		
DATE:	December 3-4, 2020	INFORMATION:	

BACKGROUND:

The Alaska Retirement Management Board's (ARMB) "Private Equity Partnerships Portfolio Policies and Procedures" calls for the preparation and adoption of an "Annual Tactical Plan" (Plan).

STATUS:

Staff presented the Plan to the ARMB at the December 2020 board meeting.

The Plan reviewed the current status of the portfolio, historical and prospective market conditions, and the annual investment strategy designed to further the ARMB's goals and objectives for the private equity program.

Staff is recommending the Board approve the Plan which includes forward commitment targets starting at $600 million in 2021 and increasing over time to maintain the ARMB's long-term private equity allocation of 12%. The commitments will be allocated equally between Abbott, Pathway, and direct investments.

RECOMMENDATION:

The Alaska Retirement Management Board adopt Resolution 2020-18 approving the 2020 Private Equity Annual Tactical Plan.

State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD

Relating to Private Equity Annual Tactical Plan
Resolution 2020-18

WHEREAS, the Alaska Retirement Management Board (Board) was established by law to serve as trustee to the assets of the State's retirement systems; and

WHEREAS, under AS 37.10.210-220, the Board is to establish and determine the investment objectives and policy for each of the funds entrusted to it; and

WHEREAS, AS 37.10.071 and AS 37.10.210-220 require the Board to apply the prudent investor rule and exercise the fiduciary duty in the sole financial best interest of the funds entrusted to it and treat beneficiaries thereof with impartiality; and

WHEREAS, the Board contracts an independent consultant to provide experience and expertise in asset allocation and other investment matters to come before the Board; and

WHEREAS, the Board has established an asset allocation for the funds that considers earnings and liabilities on a current as well as a future basis; and

WHEREAS, the Board has authorized investment in private equity assets for the State of Alaska Retirement and Benefits Plans; and

WHEREAS, the Board will establish, and on an annual basis review, an investment plan for private equity;

NOW THEREFORE, BE IT RESOLVED THAT THE ALASKA RETIREMENT MANAGEMENT BOARD adopts the 2020 Annual Tactical Plan for Private Equity.

DATED at Anchorage, Alaska this 4th day of December 2020.

Chair

ATTEST:

Gayle Harbo

Secretary

Callan

December 3, 2020

ARMB Private Equity Portfolio

Annual Review and Performance Analysis

Gary Robertson
Senior Vice President

Private Equity Discussion Topics

- ARMB Private Equity Program Overview
- Market Conditions
- ARMB Private Equity Portfolio and Manager Performance
  - Fiscal Year Changes
  - Vintage Year and Strategy Benchmarking
  - Strategy Diversification
- Summary

Appendix

- How Private Equity Works (Cash Flows)

ARMB Private Equity Program Overview

Timeline

- 1998 ARMB initiates a 3% allocation 22 years ago and hires Abbott to invest in partnerships
- 2001 ARMB raises the allocation to 6%
- 2001 Hires Pathway to develop a second partnerships portfolio
- 2006 Private equity allocation raised to 7%
- 2007 ARMB initiates Treasury private equity portfolio
- 2011 Private equity allocation raised to 8%
- 2013 Private equity allocation raised to 9%
- 2016 Corporate governance partnerships exited
- 2019 Private equity allocation raised to 11%
- 2020 Private equity allocation rose to 12% as of July 1, 2020, and the Military plan added a new 4% target allocation

ARMB Private Equity Program Overview

Funding

- ARMB's total assets decreased $9.3 million (0.03%) during the 12-month period, so the private equity target decreased by $37 million (0.03%) proportionately
- The total private equity NAV increased by $391 million (13.2%)
- The private equity funded-level increased 1.4% and is 1.5% above the fiscal year end target, but is well within its range of +/- 6%
- As of July 1, 2020, the target was increased to 12%, and the Military Plan initiated a new 4% private equity allocation (target of approximately $1.6 million); so the allocation is currently closer to its mid-point.

As of June 30, 2020

Measure	2019	2020	%
Total Assets*	**26,836,845,024**	**26,827,500,298**	
PE % Target	**11.0%**	**11.0%**	
PE $ Target	**2,952,052,953**	**2,951,025,033**	
Abbott	**1,149,619,328**	**1,291,512,866**	**38%**
Pathway	**1,286,149,961**	**1,495,285,369**	**45%**
In-House	**532,092,840**	**572,535,672**	**17%**
Total Private Equity	**2,967,862,129**	**3,359,333,907**	**100%**
% PE	**11.1%**	**12.5%**	
Difference from Target	**15,809,176**	**408,308,874**	

* Treasury Financials less MRS which doesn't invest in PE.

* Total Assets value is adjusted for June 30 actual private equity valuations.

- ARMB's uncalled capital is 50% of the new 12% target. Uncalled at 50% of the target will support the NAV near the target level.
- Given asset valuations, Callan is encouraging clients to be mindful of "denominator effects"

Private Equity Market Conditions

Economic Contraction and Uncertainty, Resilient but Volatile Investment Markets

- In 2019, equity markets experienced a strong rise (Russell 3000 Index: +31.0%). Private equity also delivered double digit returns (Cambridge PE Index +16.3%). The first two quarters of 2020 have seen a large decline and strong recovery, and at present, total plan values have preserved their gains.
- In 1Q20 private equity fell -7.8% versus the Russell 3000 Index (-20.9%), but the 2Q rally (Russell 3000 Index: +22.0%) was also less pronounced for PE with a 10% uplift.
- Distributions slowed in 2019 but remained strong for a seventh year. They have slowed further in 1H20. A similar declining pattern occurred for new company investment pace, first due to high 2019 prices then 1H20 uncertainty.
- Fundraising demand has not slackened and increased to $692 billion in 2019 (from $658 billion) supported by significant distributions and strong total plan valuation increases. Through 3Q20 fundraising has dipped 7%.
  - Fundraising count has fallen 18% so far in 2020 but more commitments are being made to larger funds.
- Average U.S. buyout deal pricing set a record high in 2019 of 11.5x EBITDA. Prices then dropped 20% to 9.2x at 1H20, but has since rebounded to 11.0x through 3Q20.
- Credit is available at low interest rates, but lenders are being more selective which is also hampering private M&A activity.
  - Non-bank private debt funds are supporting supply.
  - Through 3Q20, equity contributions remain relatively large (average 50% of total purchase price).
- Exits and distributions were down somewhat in 2019 (-13%), but still provided strong liquidity for mature portfolios. 3Q20 volumes are down an average of about 30%, although the market shows signs of stabilizing.
- The path forward is less certain than at other times, but GPs have largely completed shoring-up their existing portfolio companies and are seeking to engage again in transaction activity. It is too soon to discern a distinct trend; both with the economy and private equity activity.

ARMB Private Equity Performance

Total Portfolio: 12-Month Changes, June 30, 2020 ($000)

Year	Committed	Paid-In	Uncalled	Distributed	NAV	DPI	RVPI	TVPI	IRR	%PI
2019	6,788,145	5,373,191	1,682,315	5,429,747	2,967,862	1.01	0.55	1.56	11.8%	75%
2020	7,242,387	5,975,556	1,612,590	5,945,076	3,359,334	0.99	0.56	1.56	11.8%	78%
Change	**454,242**	**602,366**	**(69,724)**	**515,328**	**391,472**	**(0.02)**	**0.01**	**(0.01)**	**-0.1%**	**3%**
% Chg	7%	11%	-4%	9%	13%	-2%	2%	0%	-1%	3%

All returns are net of all underlying partnership fees, carried interest, and expenses, but gross of ACM, PCM and Treasury fees and expenses
All manager holdings are June 30 actual values and cash flows
A change in the Uncalled data occurs this year for 2019 and 2020. Actual uncalled replaces the prior calculation of Committed minus Paid-In.
NAV differs from Treasury Financials: Table data is June 30, 2020 actuals, Financials figures are 1Q20 NAV adjusted for 2Q20 cash flows
DPI = Distributions as a ratio of (divided by) Paid-In capital
RVPI = Residual Value (Net Asset Value) as a ratio of (divided by) Paid-In Capital
TVPI = Total Value (Distributions + NAV) as a ratio of (divided by) Paid-In Capital
Benchmarks are Refinitiv/Cambridge All Regions 6/30/20

Key Metrics	
$ Gross Distributions	515,328
Gross Distribution Yield(1)	17.4%
$ Net Distributions	(87,037)
Net Distribution Yield(2)	**-2.9%**
$ NAV Increase	391,472
% NAV Increase	**13.2%**
$ Total Increase	304,434
% Total Increase	**10.3%**

(1) Gross Distributions / Starting NAV
(2) Gross Distributions / Starting NAV
(Both include return of capital and gains)

1. Commitments increased by $454 million (7%), down from $602 million (10%) the prior year
2. Paid-in capital increased $602 million (11%) year, and represents 36% of the starting uncalled amount
3. Uncalled capital fell $70 million (4%), the uncalled calculation underwent a footnoted one-time change this year
4. The portfolio is 78% paid-in (mature), up from 75% last year (Abbott 82%, Pathway 79%, and Treasury 64%)
5. The portfolio distributed $515 million, a 17% gross cash flow return (distributions divided by beginning NAV); down from $538 million (21%) last year
6. Net cash flow to ARMB was -$87 million (-3%) (ARMB funded the portfolio), versus +$36 million (1.4%) last year
7. NAV increased by $391 million (13%), down from $409 million (16%) last year
8. Total portfolio appreciation was $304 million (10%), compared to $446 million (17%) last year
9. IRR of 11.8% is second quartile versus the Refinitiv/Cambridge All Region composite since 1998, which has a top quartile of 16.6% and a median of 8.5% (40th percentile)
10. Performance ratios were mixed due to the large increase in paid-in. The TVPI of 1.56x is second quartile versus the Refinitiv/Cambridge upper quartile of 1.82x and a median of 1.34x (39th percentile)
11. Since inception the private equity IRR of 11.8% outpaces its benchmark IRR of 7.3% on a Public Market Equivalent (PME) basis by a spread of 4.4%. The calculation excludes a stated 2% premium.
    - The custom benchmark indices are is 1/3 each of S&P 500, Russell 2000, and MSCI EAFE.

ARMB Private Equity Performance

Total Portfolio Summary Change Metrics: Last 14 Years Ended June 30, 2020 ($000)

ARMB Summary Changes Metrics - Fiscal Years ended June 30 ($000)

Cumulative Values	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Commitments	2,095,104	2,474,744	2,742,373	2,863,483	3,137,245	3,376,366	3,536,444	3,969,626	4,610,928	5,160,640	5,621,856	6,186,603	6,788,145	7,242,387
Paid-In	1,383,305	1,698,786	1,882,191	2,043,035	2,285,180	2,546,467	2,812,066	3,073,494	3,474,104	3,794,225	4,342,127	4,871,540	5,373,191	5,975,556
% PI	66%	69%	69%	71%	73%	75%	80%	77%	75%	74%	77%	79%	75%	78%
Uncalled	711,799	773,553	857,745	818,549	850,282	830,317	803,896	995,506	1,266,675	1,513,668	1,328,780	1,315,377	1,682,315	1,612,590
Distributed	828,482	1,053,166	1,135,362	1,278,525	1,565,519	1,859,734	2,332,346	2,792,318	3,306,981	3,719,577	4,294,389	4,891,153	5,429,747	5,945,076
NAV	1,061,115	1,283,311	1,069,319	1,289,123	1,497,378	1,604,129	1,610,963	1,726,998	1,831,824	1,836,486	2,208,113	2,559,067	2,967,862	3,359,334

Annual Changes	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Commitments	273,848	379,640	267,629	121,110	273,762	239,121	160,078	433,182	641,302	549,712	461,216	564,747	601,542	454,242
Paid-In	283,329	315,481	183,405	160,844	242,145	261,287	265,599	261,428	400,610	320,121	**547,902**	529,413	**501,650**	**602,366**
Uncalled	(9,482)	61,754	84,192	(39,196)	31,733	(19,965)	(26,421)	191,610	271,169	246,993	(184,888)	(13,403)	366,937	(69,724)
Gross Distributed	300,837	224,684	82,196	143,163	286,994	294,215	472,612	459,972	**514,663**	412,596	**574,812**	**596,764**	538,594	515,328
Net Cash Flow	17,508	(90,797)	(101,209)	(17,681)	44,849	32,928	**207,013**	198,544	114,053	92,475	26,910	67,350	36,944	(87,037)
NAV	201,726	222,196	(213,992)	219,804	208,255	106,751	6,834	116,035	104,826	4,662	**371,628**	350,954	**408,795**	**391,472**
Total Appreciation	219,234	131,399	(315,201)	202,123	253,104	139,679	213,847	314,579	218,879	97,137	**398,538**	**418,304**	**445,739**	**304,434**

Annual Results (Change/Prior NAV)		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Gross Cash Flow Return	35%	21%	6%	13%	22%	20%	29%	29%	30%	23%	31%	27%	21%	17%
Paid-In Change	26%	23%	11%	9%	12%	11%	10%	9%	13%	9%	14%	12%	10%	11%
Net Cash Flow Return	2%	-9%	-8%	-2%	3%	2%	13%	12%	7%	5%	1%	3%	1%	-3%
NAV % Increase	23%	21%	-17%	21%	16%	7%	0%	7%	6%	0%	20%	16%	16%	13%
Total Portfolio Appreciation	26%	12%	-25%	19%	20%	9%	13%	20%	13%	5%	22%	19%	17%	10%

PE Funded Versus Target	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Target	7.0%	7.0%	6.6%	7.0%	8.0%	8.0%	8.0%	9.0%	9.0%	9.0%	9.0%	9.0%	11.0%	11.0%
% Funded	6.7%	8.5%	8.7%	9.6%	9.2%	9.9%	8.9%	8.2%	7.6%	8.0%	8.8%	9.7%	11.1%	12.5%
Over/(Under) Target	-0.3%	1.5%	2.1%	2.6%	1.2%	1.9%	0.9%	-0.8%	-1.4%	-1.0%	-0.2%	0.7%	0.1%	1.5%

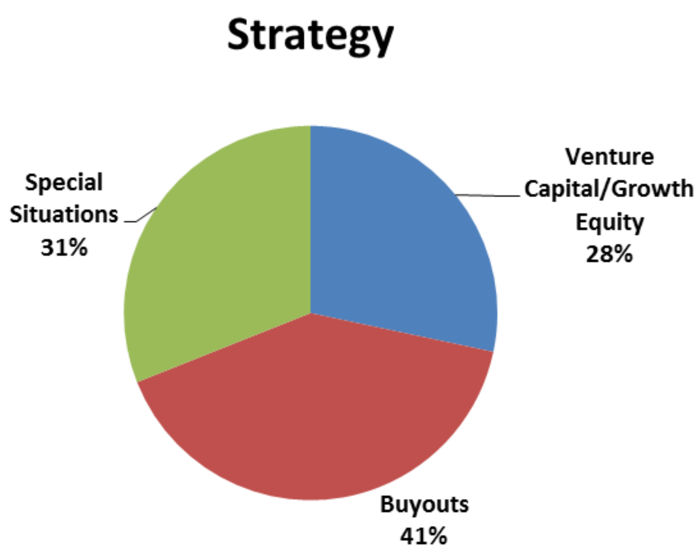
Key:	Low	Muted	Moderate	High

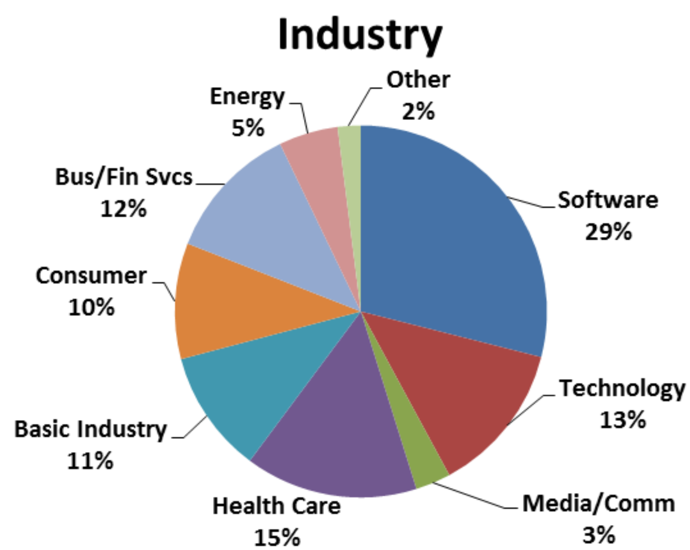
Performance Ratios	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
DPI	0.60	0.62	0.60	0.63	0.69	0.73	0.83	0.91	0.95	0.98	0.99	1.00	1.01	0.99
RVPI	0.77	0.76	0.57	0.63	0.66	0.63	0.57	0.56	0.53	0.48	0.51	0.53	0.55	0.56
TVPI	1.37	1.38	1.17	1.26	1.34	1.36	1.40	1.47	1.48	1.46	1.50	1.53	1.56	1.56

Color coding characterizations are qualitative and provided in the context of market and portfolio dynamics—not performance assessment

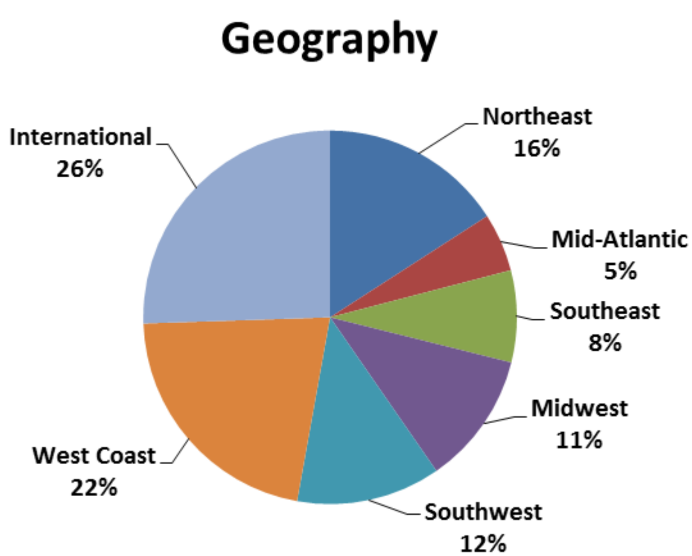
- The portfolio's DPI and TVPI Return have been gradually increasing over the 14 year period, and continued long-term compounding is expected.
- Fiscal 2020 saw significant capital markets volatility in the second half, resulting a small downtick in otherwise good gross distributions.
- Recent increases in commitments resulting increased paid-in has decreased net cash flow from the portfolio in 2020.

ARMB Portfolio Diversification June 30, 2020





International = Europe 17%, Asia 4%, and Rest-of-World 5%



Strategy allocations are based on underlying partnership valuations for ACM, PCM, and Treasury
Industry allocations are based on underlying portfolio company valuations for ACM, PCM, and Treasury
Geographic allocations are based on underlying portfolio company valuations for ACM and PCM. Treasury portfolio is U.S. 75%, Europe 16%, Asia 4%, and ROW 5%

Abbott Capital Management Profile

- Founded in 1986. The firm is an independent registered investment advisor and is employee-owned by Abbott's 10 Managing Directors (95%) and one retired co-founder (5%)
- ACM has 14 senior investment professionals, 7 junior investment professionals, and a total staff of 61 employees
- ACM has had a stable team with little senior professional turnover. The head of Investor Relations retired at the end of 2018, the head of Secondary Investing retired year-end 2019, and the Chief Operating Officer will retire at the end of 2020. Abbott has added staff to compensate for the departures.
- The firm is headquartered in New York and has an additional office in London
- The firm has $10 billion in AUM (Uncalled + NAV), in both fund-of-funds and separate accounts, and has a large established client base. ARMB represents 19% of the ACM's AUM
- ACM's ARMB investment program started in mid-1998 and represents 38% of the ARMB's private equity portfolio NAV
- ACM invests in all key private equity strategies, except distressed debt, in a diversified manner. The firm has strong relationships in venture capital and an expertise in non-US investing
- Callan would characterize ACM as a conservative global boutique, with strong historical experience in venture capital and European private equity investing. The firm also has long-standing with highly-developed corporate finance funds

ARMB Private Equity Performance

Abbott Portfolio: 12-Month Changes, June 30, 2020 ($000)

Year	Committed	Paid-In	Uncalled	Distributed	NAV	DPI	RVPI	TVPI	IRR	%PI
2019	2,914,374	2,402,605	582,710	2,658,720	1,149,619	1.11	0.48	1.59	10.6%	80%
2020	3,095,400	2,603,240	568,205	2,837,954	1,291,513	1.09	0.50	1.59	10.5%	82%
Change	**181,026**	**200,635**	**(14,505)**	**179,234**	**141,894**	**(0.02)**	**0.02**	**0.00**	**0.0%**	**2%**
% Chg	6%	8%	-2%	7%	12%	-1%	4%	0%	0%	2%

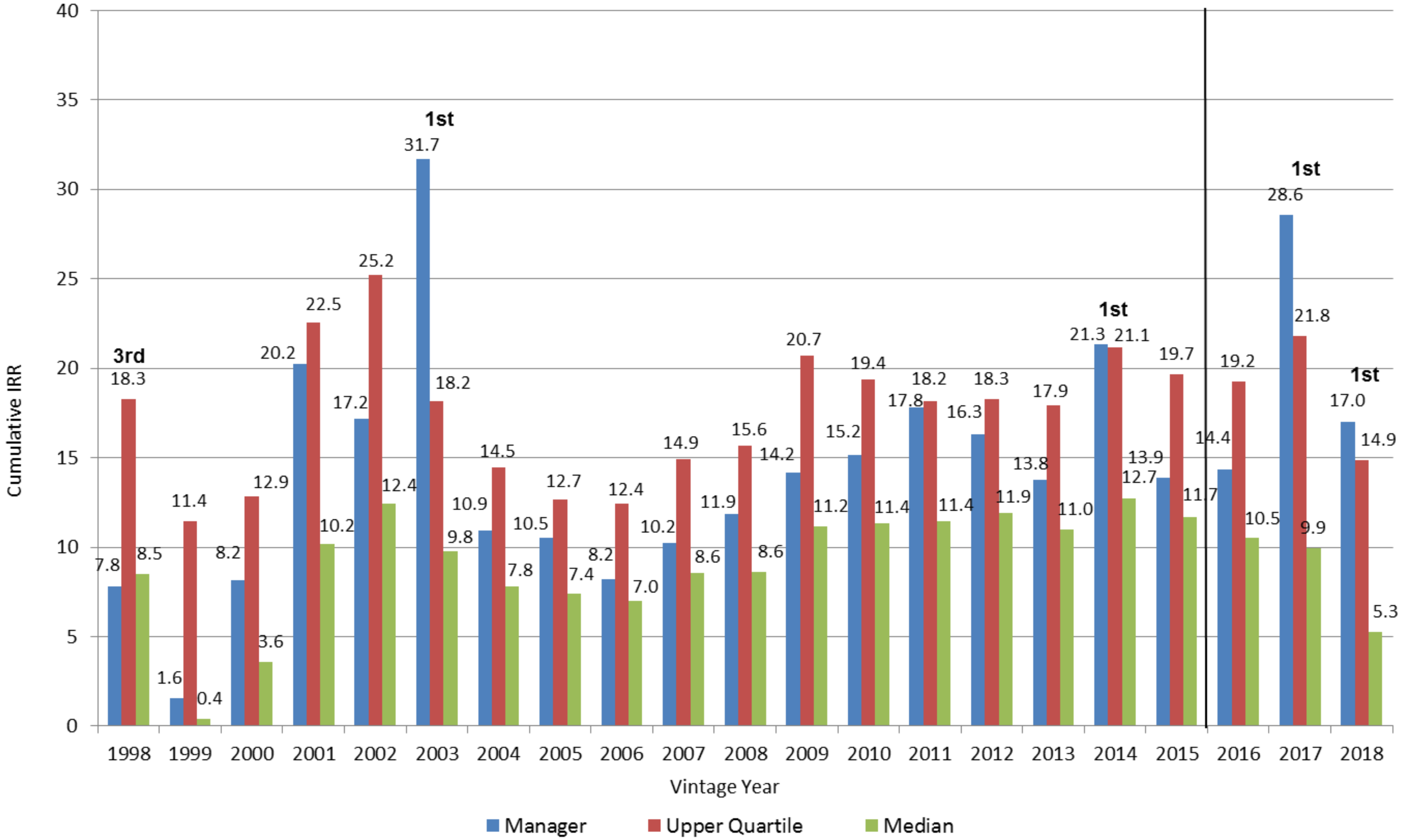
Key Metrics	
$ Gross Distributions	179,234
Gross Distribution Yield	15.6%
$ Net Distributions	(21,401)
Net Distribution Yield	**-1.9%**
$ NAV Increase	141,894
% NAV Increase	**12.3%**
$ Total Increase	120,492
% Total Increase	**10.5%**

1. Initiated 22 years ago, invested in 278 investments of which 226 remain active, and 52 have liquidated.
2. Commitments increased $181 million (6%), moderating from $200 million (7%) last year
3. Paid-in increased $201 million (8%), close to the $193 million (9%) last year; and represents 36% of the starting uncalled amount
4. The portfolio is 82% paid-in (*fully* mature), but went net cash flow negative after being positive for five years
5. Uncalled capital decreased $15 million (-2%), the uncalled calculation underwent a one-time change this year
6. The portfolio distributed $179 million (16% cash flow yield), down from $224 million (23%)
7. Portfolio net cash flow was a negative $21 million (-2%) as more capital was paid-in that distributed, down from a positive $31 million (3%) in the prior year
8. NAV rose $142 million (12%), down from last year's $170 million (17%) increase
9. Total portfolio appreciation was $120 million (11%), down from $200 million (21%) last year
10. Abbott's 10.5% IRR is second quartile versus the Refinitiv/Cambridge All Region composite since 1998, which has a top quartile of 16.6% and a median of 8.5% (44th percentile)
11. The 1.59x TVPI is also second quartile versus a top quartile of 1.82x and a median of 1.34x (37th percentile)

All returns are net of all underlying partnership fees, carried interest, and expenses, but gross of ACM fees and expenses
All manager holdings are June 30 actual values and cash flows
DPI = Distributions as a ratio of (divided by) Paid-In capital
RVPI = Residual Value (Net Asset Value) as a ratio of (divided by) Paid-In Capital
TVPI = Total Value (Distributions + NAV) as a ratio of (divided by) Paid-In Capital
Benchmarks are Refinitiv/Cambridge All Regions 6/30/20

Abbott: Cambridge Vintage Year Peer Group Benchmark

IRRs and All Region Benchmarks as of June 30, 2020



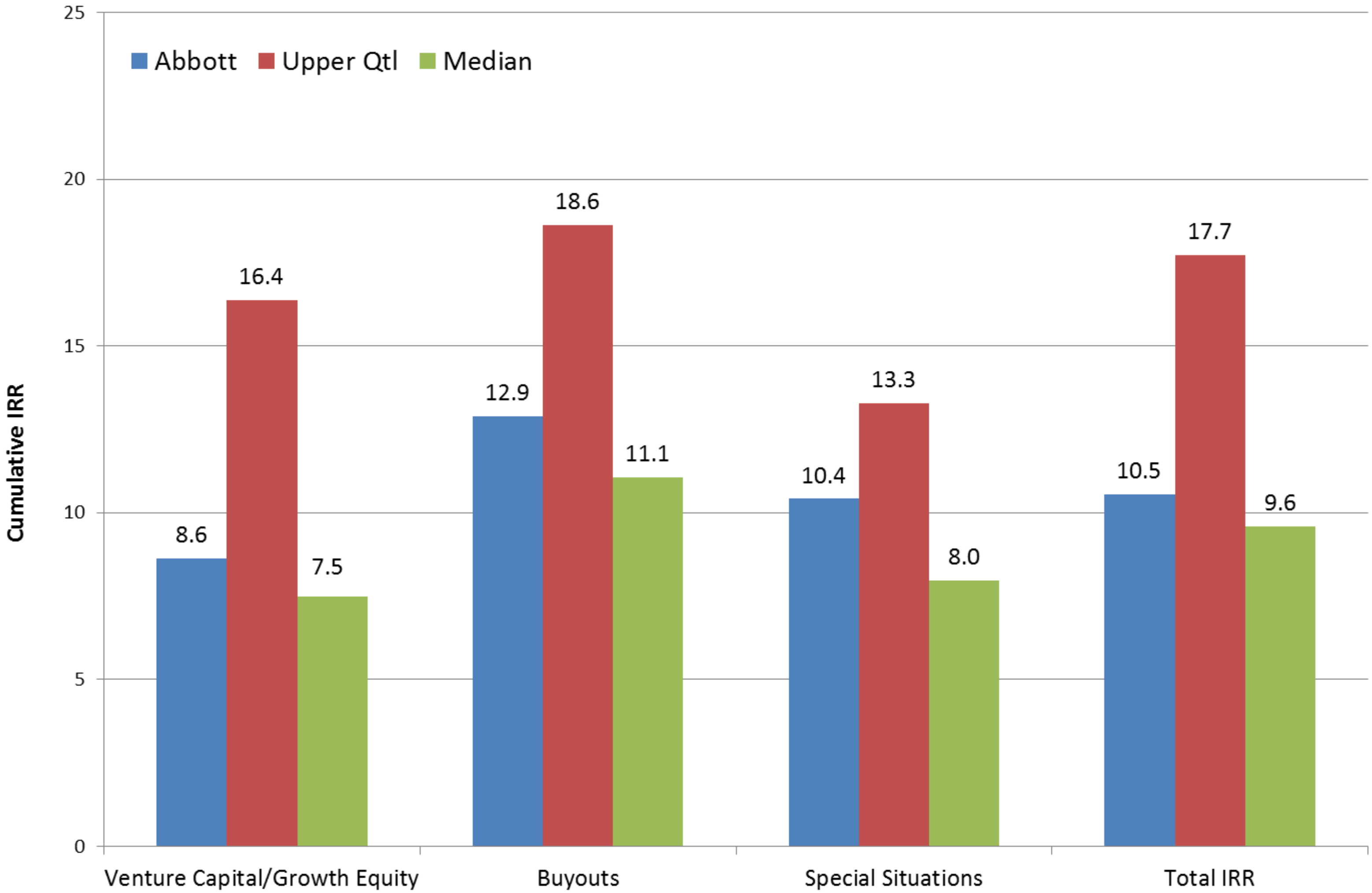
1st Quartile: 4 years　　2nd Quartile: 16 years　　Below Median: 1 years

All returns are net of all underlying partnership fees, carried interest, and expenses, but gross of ACM fees and expenses

Refinitiv/Cambridge Benchmarks: Venture Capital, Growth Equity, Buyouts, Mezzanine, Opportunistic Credit, Control Distressed, Private Energy

Abbott: Cambridge Strategy Peer Group Benchmark

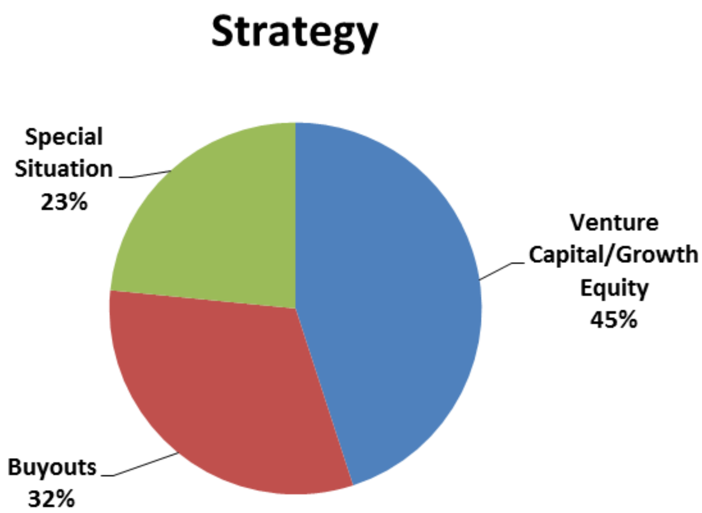
Cumulative Composite Benchmarks Inception through June 30, 2020

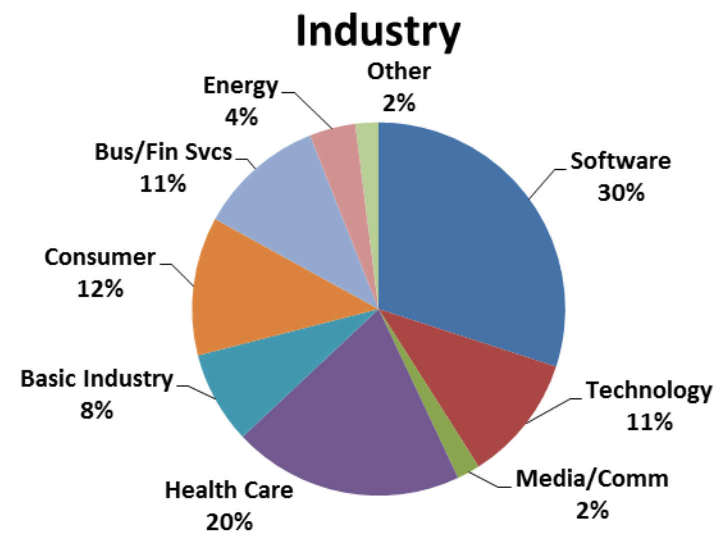


2nd Qtl | 2nd Qtl | 2nd Qtl | 2nd Qtl

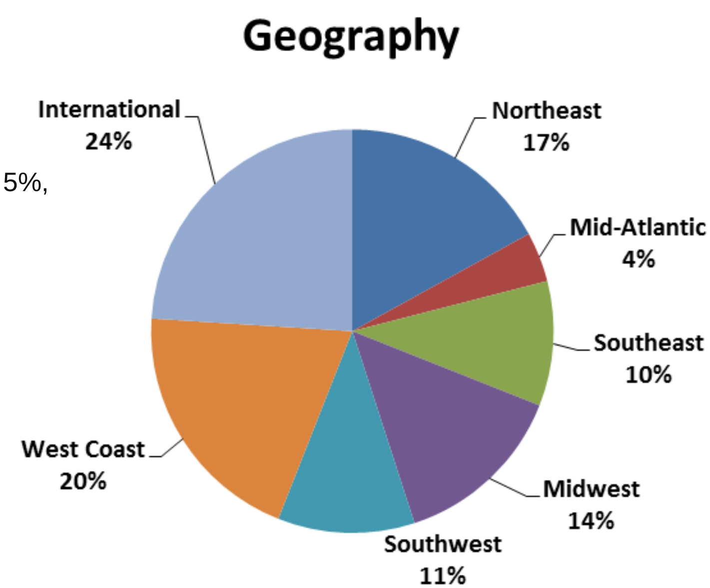
All Composites: VY 1998 – 2020
All returns are net of all underlying partnership fees, carried interest, and expenses, but gross of ACM fees and expenses

ACM Portfolio Diversification June 30, 2020





International = Europe 16%, Asia 5%, and Rest-of-World 3%



Note: Strategy is based on underlying partnership valuations. Industry, and Geography allocations are based on underlying portfolio company valuations

Pathway Capital Management Profile

- Founded in 1991. The firm is an independent registered investment advisor and is wholly owned by its 21 partners. PCM has 19 senior investment professionals, 50 junior investment professionals, and 187 total employees
- The firm is headquartered in Irvine, CA with an additional U.S. office in Providence, RI, and international offices in London, and Hong Kong. PCM also has a Japan-based Pacific Basin alliance with its client Tokyo Marine
- PCM has had a generally stable team. In the last five years, there have been only three senior departures (SVP and above) of which 2 were retirements. The firm maintains a deep staff.
- Total AUM is $60.3 billion (NAV plus uncalled), with a large established client base. ARMB represents 3.5% of PCM's AUM
- Pathway's portfolio initiated in mid-2002 and represents 45% of the ARMB's private equity portfolio NAV
- Pathway states that they use a market-weighting investment strategy and do not tend to overweight particular investment strategies. The investment approach is conservative, investing with highly developed general partners with proven track records and experience investing through market cycles, primarily in developed markets
- Callan would characterize PCM as a conservative global boutique core manager that invests in key private equity strategies, except mezzanine and has an expertise in non-US investing. The firm's corporate finance investments have a mid- to large-buyouts orientation

ARMB Private Equity Performance

Pathway Portfolio: 12-Month Changes, June 30, 2020 ($000)

Year	Committed	Paid-In	Uncalled	Distributed	NAV	DPI	RVPI	TVPI	IRR	%PI
2019	2,640,868	2,179,137	634,101	2,272,801	1,286,150	1.04	0.59	1.63	14.2%	76%
2019	2,834,084	2,425,448	602,877	2,497,729	1,495,285	1.03	0.62	1.65	14.2%	79%
Change	**193,215**	**246,311**	**(31,224)**	**224,928**	**209,135**	**(0.01)**	**0.03**	**0.01**	**0.0%**	**3%**
% Chg	7%	11%	-5%	10%	16%	-1%	4%	1%	0%	4%

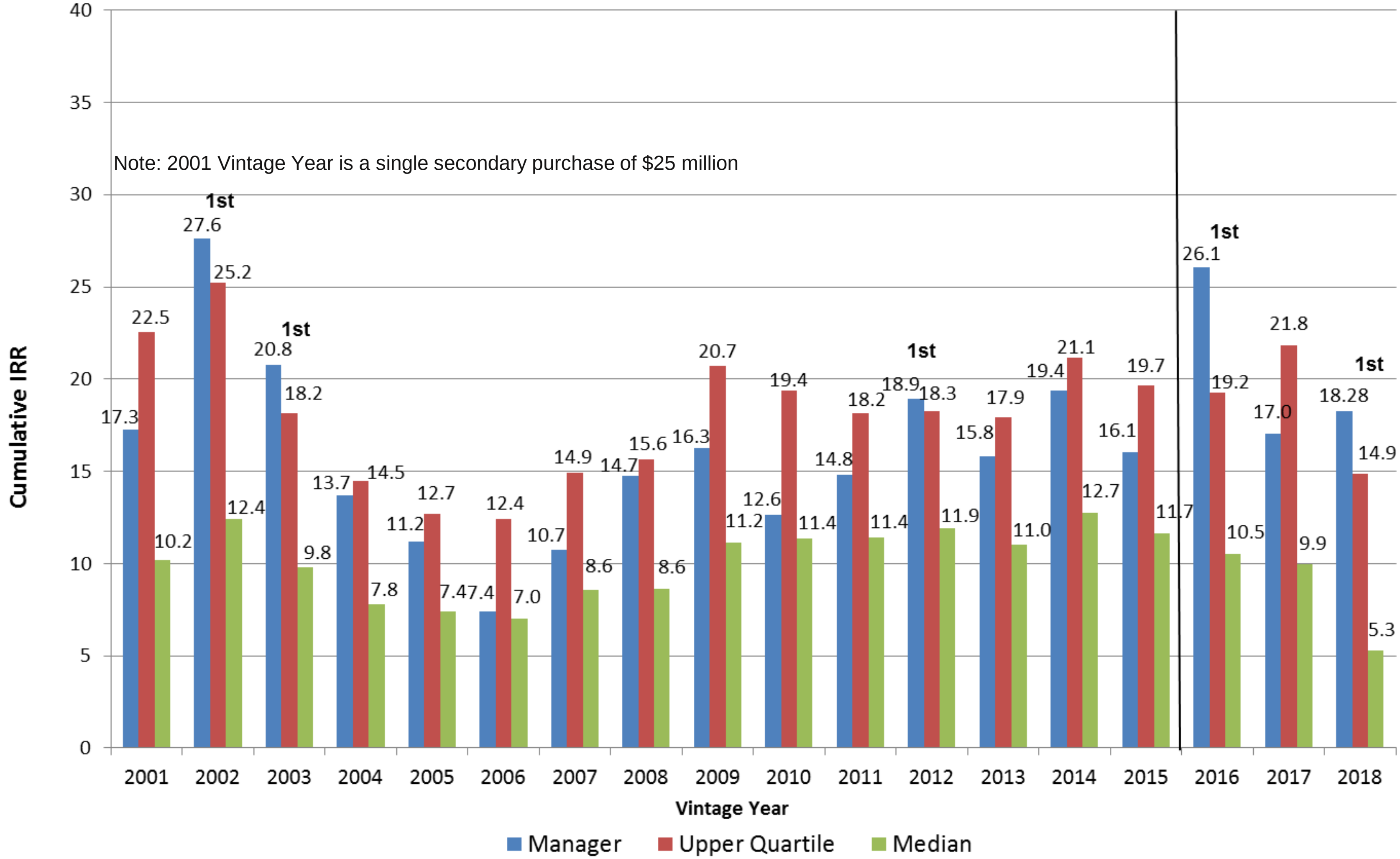
Key Metrics	
$ Gross Distributions	224,928
Gross Distribution Yield	17.5%
$ Net Distributions	(21,383)
Net Distribution Yield	**-1.7%**
$ NAV Increase	209,135
% NAV Increase	**16.3%**
$ Total Increase	187,753
% Total Increase	**14.6%**

1. Initiated 18 years ago, invested in 283 investments of which 264 remain active, and 19 have liquidated.
2. Commitments increased $193 million (9%), moderating from $216 million (9%) last year
3. Paid-in increased $246 million (11%), up from $227 million (12%) last year; and represents 39% of the starting uncalled amount
4. The portfolio is 79% paid-in (*fully* mature), but went net cash flow negative after being positive for three years
5. Uncalled capital declined $31 million (-5%), the uncalled calculation underwent a one-time change this year
6. Distributions were $225 million (18% cash flow yield), a lower yield than the $256 million (23%) last year
7. Portfolio net cash flow was a negative $31 million (-2%) as more capital was paid-in that distributed, down from a positive $29 million (3%) last year
8. NAV increased $209 million (16%), up from the $175 million (16%) last year
9. Total portfolio appreciation was $187 million (15%), down from the $204 million (18%) last year
10. Pathway's 14.2% IRR is second quartile versus the Refinitiv/Cambridge All Region composite since 2002, which has a top quartile of 16.9% and a median of 9.0% (33th percentile)
11. The 1.65x TVPI is also second quartile versus the top quartile and median of 1.83x and 1.36x (35th percentile)

All returns are net of all underlying partnership fees, carried interest, and expenses, but gross of PCM fees and expenses
All manager holdings are June 30 actual values and cash flows
DPI = Distributions as a ratio of (divided by) Paid-In capital
RVPI = Residual Value (Net Asset Value) as a ratio of (divided by) Paid-In Capital
TVPI = Total Value (Distributions + NAV) as a ratio of (divided by) Paid-In Capital
Benchmarks are Refinitiv/Cambridge All Regions 6/30/20

Pathway: Cambridge Vintage Year Peer Group Benchmark

IRRs and All Region Benchmarks as of June 30, 2020

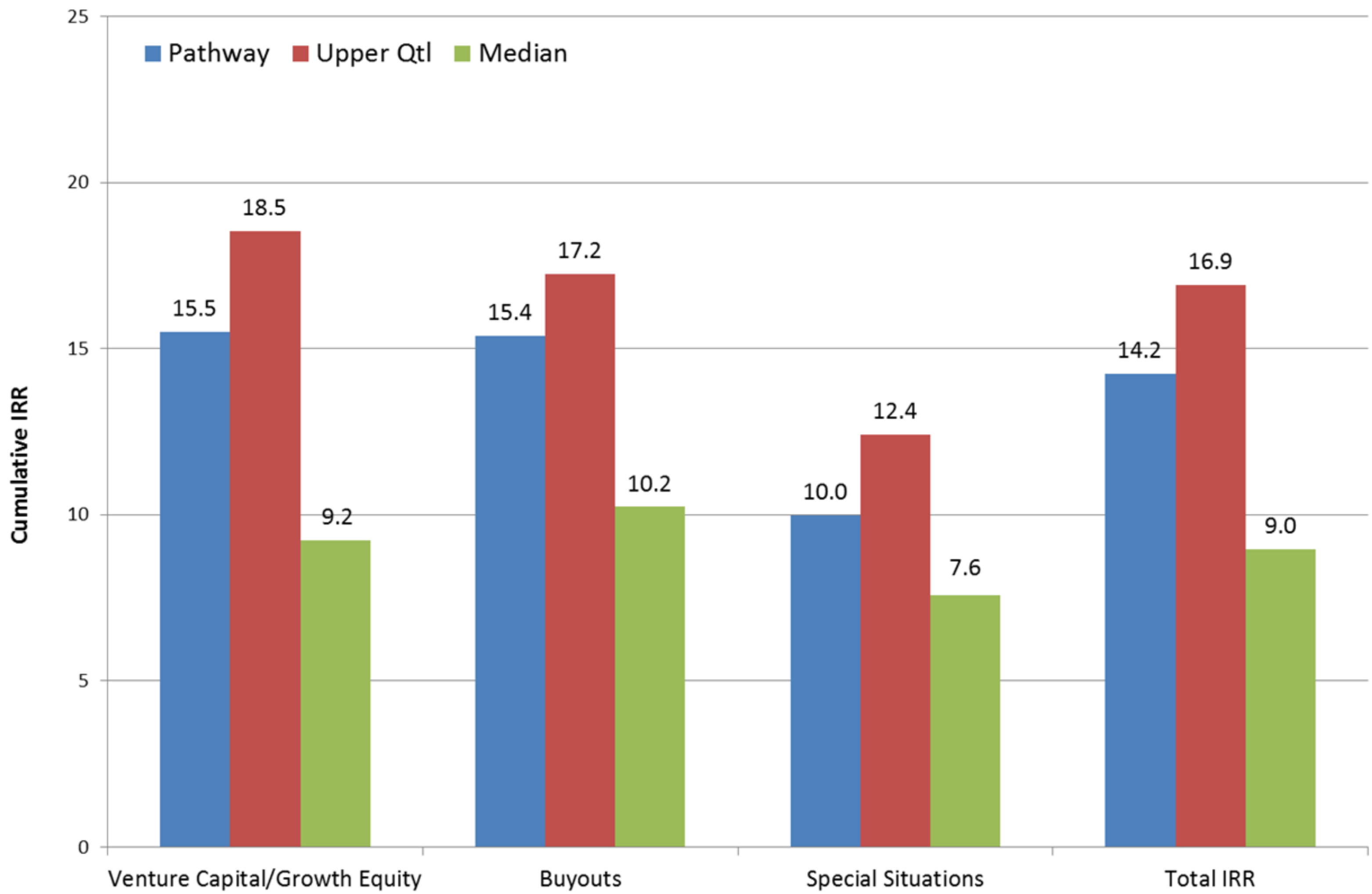


1st Quartile: 5 years 2nd Quartile: 13 years Below Median: 0 years

All returns are net of all underlying partnership fees, carried interest, and expenses, but gross of PCM fees and expenses
Refinitiv/Cambridge Benchmarks: Venture Capital, Growth Equity, Buyouts, Mezzanine, Opportunistic Credit, Control Distressed , Private Energy

Pathway: Cambridge Strategy Peer Group Benchmark

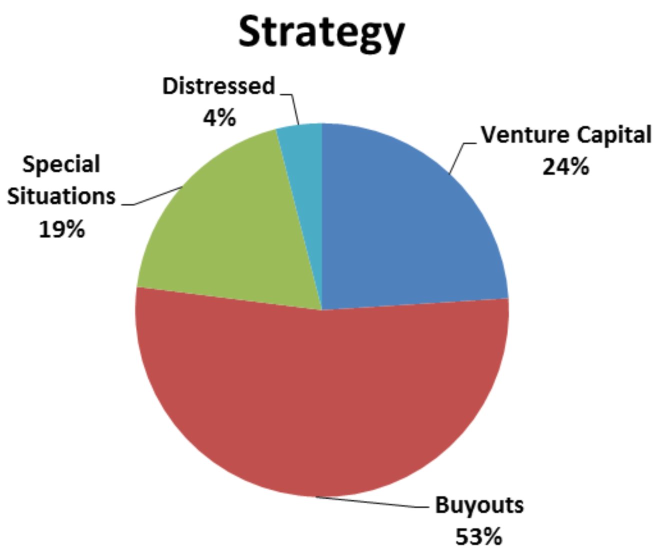
Cumulative Composite Benchmarks Inception through June 30, 2020

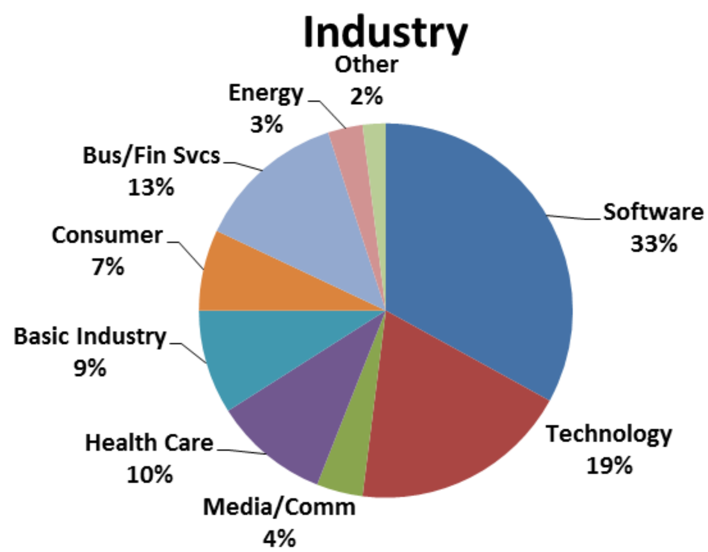


2nd Qtl	2nd Qtl	2nd Qtl	2nd Qtl

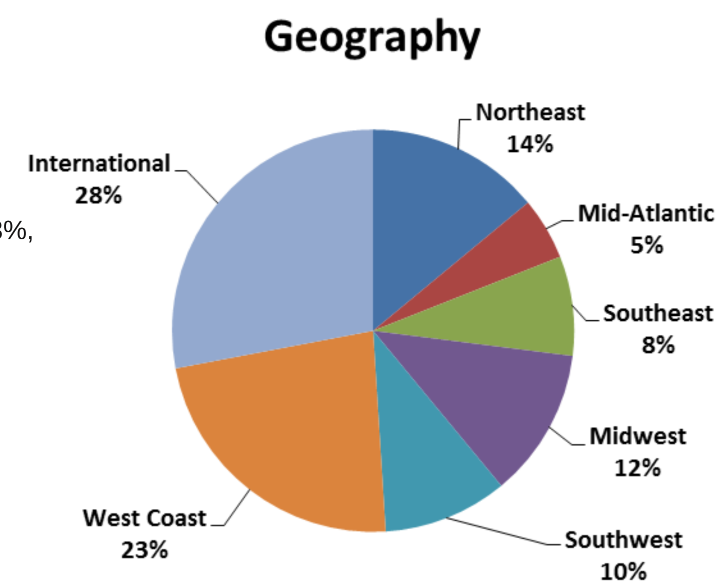
All Composites: VY 2002 – 2020
All returns are net of all underlying partnership fees, carried interest, and expenses, but gross of PCM fees and expenses

PCM Portfolio Diversification June 30, 2020





International = Europe 18%, Asia 3%, and Rest-of-World 7%



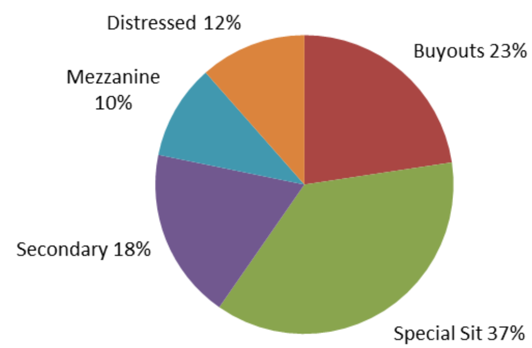
Note: Strategy is based on underlying partnership valuations. Industry, and Geography allocations are based on underlying portfolio company valuations

Treasury Portfolio Overview June 30, 2020 ($000)

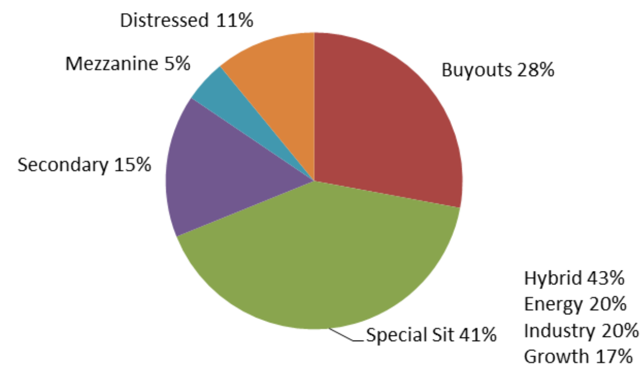
	Partnership	VY	Strategy	Overlap	Committed	Paid-In	% PI
1	Warburg Pincus X	2007	Special Sit	ACM	30,000,000	30,274,298	100%
2	Onex III	2008	Buyout	PCM	25,000,000	26,698,834	92%
3	AG CRP VI	2008	Distressed	None	25,000,000	25,000,000	91%
4	Merit V	2010	Mezzanine	None	25,000,000	23,681,633	95%
5	Lexington VII	2010	Secondary	None	75,000,000	69,244,834	84%
6	Warburg XI	2012	Special Sit	ACM	30,000,000	32,157,507	100%
7	Resolute III	2013	Buyout	None	20,000,000	22,706,520	91%
8	New Mountain IV	2013	Buyout	ACM/PCM	25,000,000	20,575,161	90%
9	Warburg Pincus Pr	2013	Special Sit	None	65,000,000	62,432,500	96%
10	NB SOF III	2013	Secondary	PCM	50,000,000	22,176,896	71%
11	Glendon Opps	2014	Distressed	None	40,000,000	37,981,992	72%
12	Lexington VIII	2014	Secondary	None	50,000,000	43,195,720	78%
13	KKR Lending II	2015	Credit	None	100,000,000	107,824,626	91%
14	NGP XI	2015	Energy	None	50,000,000	43,847,899	96%
15	Dyal III	2015	Special Sit	None	50,000,000	42,012,320	37%
16	Advent VIII	2016	Buyout	ACM/PCM	25,000,000	23,425,000	94%
17	Summit GE IX	2017	Growth Equity	PCM	40,000,000	44,168,000	78%
18	New Mountain V	2017	Buyout	None	50,000,000	33,332,492	68%
19	NB SOF IV	2017	Secondary	None	50,000,000	23,726,735	47%
20	Glendon Opps II	2017	Distressed	PCM	75,000,000	35,625,000	48%
21	NGP XII	2018	Energy	ACM/PCM	40,000,000	21,893,531	52%
22	Resolute IV	2018	Buyout	ACM/PCM	50,000,000	29,747,312	53%
23	Dyal Capital IV	2018	Special Sit	None	40,000,000	5,078,372	8%
24	Warburg Global	2018	Special Sit	None	40,000,000	9,160,000	23%
25	Advent GPE IX	2019	Buyout	ACM/PCM	30,000,000	7,349,999	24%
26	Summit X	2019	Growth Equity	PCM	35,000,000	2,723,000	8%
27	Clearlake VI	2019	Special Sit	ACM/PCM	30,000,000	2,925,267	0%
28	New Mountain IV	2020	Buyout	None	50,000,000	0	0%
	Total				**1,215,000,000**	**848,965,448**	**64%**

	VY	# Fds	Committed	% Cmt
1	2007	1	30,000,000	2%
2	2008	2	50,000,000	4%
3	2010	2	100,000,000	8%
4	2012	1	30,000,000	2%
5	2013	4	160,000,000	13%
6	2014	2	90,000,000	7%
7	2015	3	200,000,000	16%
8	2016	1	25,000,000	2%
9	2017	4	215,000,000	18%
10	2018	4	170,000,000	14%
11	2019	3	95,000,000	8%
12	2020	1	50,000,000	4%
	Total	28	1,215,000,000	100%

Strategy Commitments



In-House Strategy NAV



- The portfolio is well-balanced and represents all key strategies except venture capital (Warburg will provide some VC exposure)
- The portfolio spans 14 years, with commitments in 12 vintage years
- 44% of commitments have been made in the last 3.5 years, so the portfolio remains in its development phase
- The investment pace by partnerships is tracking well, with funds more than three years old being highly paid-in

ARMB Private Equity Performance

Treasury Portfolio: 12-Month Changes, June 30, 2020 ($000)

Year	Committed	Paid-In	Uncalled	Distributed	NAV	DPI	RVPI	TVPI	IRR	%PI
2019	1,135,000	693,546	465,189	422,291	532,093	0.61	0.77	1.38	12.3%	59%
2020	1,215,000	848,965	441,194	533,457	572,536	0.63	0.67	1.30	10.4%	64%
Change	**80,000**	**155,420**	**(23,995)**	**111,166**	**40,443**	**0.02**	**(0.09)**	**(0.07)**	**-1.9%**	**5%**
% Chg	7%	22%	-5%	26%	8%	3%	-12%	-5%	-15%	8%

Key Metrics	
$ Gross Distributions	111,166
Gross Distribution Yield	20.9%
$ Net Distributions	(44,254)
Net Distribution Yield	**-8.3%**
$ NAV Increase	40,443
% NAV Increase	**7.6%**
$ Total Increase	(3,811)
% Total Increase	**-0.7%**

1. Initiated November 2007, 28 partnerships (+2); 17% of NAV
2. Commitments increased $80 million (+7%), down from $185 million (+19%) last year
3. Paid-in capital increased $155 million (22%), up from $81 million (13%) last year; and represents 33% of the starting uncalled amount
4. Portfolio is 64% paid-in (developing), up from 59% last year
5. Uncalled capital decreased $24 million (-5%), the uncalled calculation underwent a one-time change this year
6. Distributions were $111 million (21% of NAV), up from $57 million (12%) last year
7. Net cash flow was negative $24 million (-5%) as paid-in exceeded distributions (portfolio funding), similar to the negative $23 million (-5%) last year
8. NAV increased $40 million (8%), versus from a $64 million (14%) increase last year
9. Total portfolio appreciation was $4 million (-1%), down from the $41 million (9%) last year. The portfolio continues to build and remains dynamic, with 44% of commitments occurring since 2017 (3.5 years).
10. The portfolio is still early for benchmarking. Of the 7 years greater than 4 years old, the first five years are all second quartile, and two newest mature years (2014 and 2015) are currently fourth quartile by TVPI.
11. A goal is to gradually increase the number of partnership investments within a vintage year to five or more
12. The 10.4% IRR is second quartile versus a database upper quartile of 15.9% and median of 9.2% (46th percentile)
13. The 1.30x TVPI is second quartile versus an upper quartile of 1.59x and median of 1.28x (48th percentile)

All returns are net of all underlying partnership fees, carried interest, and expenses, but gross of Treasury expenses
Benchmark = VY 2007, 2008, 2010, 2012-2020 for Buyout, Mezzanine, Distressed, Energy, Growth Equity, Secondary

ARMB Summary

Observations

- ARMB's private equity portfolio is mature, has provided good performance, and is well-diversified
  - It has overcome initial tech-bubble timing issue and target increases
  - The portfolio was cumulatively cash flow positive for two years, but the DPI fell to 0.99x ($30 million from break-even) in Fiscal 2020 due to a large increase paid-in and lower distributions
  - The private equity allocation is close to the new Fiscal 2021 strategic allocation target of 12% (50 bps above)
  - The uncalled backlog of 50% of the target should maintain the portfolio slightly its current level but well-within its expected strategic range.

- Performance is second quartile versus a database of partnerships selected by other professionally-managed programs (~ 39^{th} percentile)
  - ARMB's performance remains highly competitive relative to its peer group of institutional investors
  - Both external managers are performing well relative to benchmarks and their strategy mixes are complementary
  - The In-House portfolio is second quartile and is still developing and dynamic
  - The portfolio is composed of tenured, high-quality general partners
  - ARMB has an attractive strategy mix for a large fund, and is well-diversified by other measures

ARMB Summary

Observations

- ARMB's private equity portfolio had another good year given unusual circumstances
  - The fiscal year saw a strong public equity market increase in its first half, followed by a large pandemic-induced decline then a rise in the second six months
  - The portfolio's investment pace increased notably (~$100 million), but distributions were mildly impacted by volatility, and the overall return was primarily supported by unrealized gains
  - Performance moderated but remained double-digit (+10%), being down 7% from last year, split between 3% less of net cash flow and 4% less of NAV increase. Much of the net cash flow reduction was due to the increase in paid-in capital

- Looking forward
  - The pandemic's initial market shock was short-lived and has largely rebounded. Capital markets appear to have entered a period of stabilization, but with increase volatility
  - So far capital market liquidity is continuing but investment pace and distributions have slowed about 30% given recent pricing uncertainty and an increased focus on existing companies
  - ARMB's portfolio is becoming mature, and is well-positioned within the private equity market with meaningful venture, growth, and U.S./developed market exposures
  - The market is trending toward increased liquidity, but pandemic-related setbacks are possible
  - While private equity is acquitting itself well through the recent economic challenges, Fiscal 2021 may not be a high-returning year
  - Callan is cautioning clients to be mindful of the "denominator effect" if public markets contract

Appendix

How Private Equity Works

ARMB invests in all major private corporate finance strategies ("private equity"):

- **Venture Capital**
  – Smaller technology/medical companies

- **Growth Equity**
  – High growth companies typically in technology, healthcare, consumer

- **Buyouts**
  – Larger company equity, traditional industries

- **Special Situations** (various smaller PE sub-strategies)
  – Debt-related (distressed debt, subordinated debt, Senior debt, opportunistic credit)
  – Energy
  – Hybrid (pursue two or more strategies, or flexible ownership/capital structure investments)
  – Industry-Specific (financial services-only, media-only, software-only, etc.)

* ARMB's strategy targets are governed by the Investment Policy Guidelines and the Annual Tactical Plan

How Private Equity Works

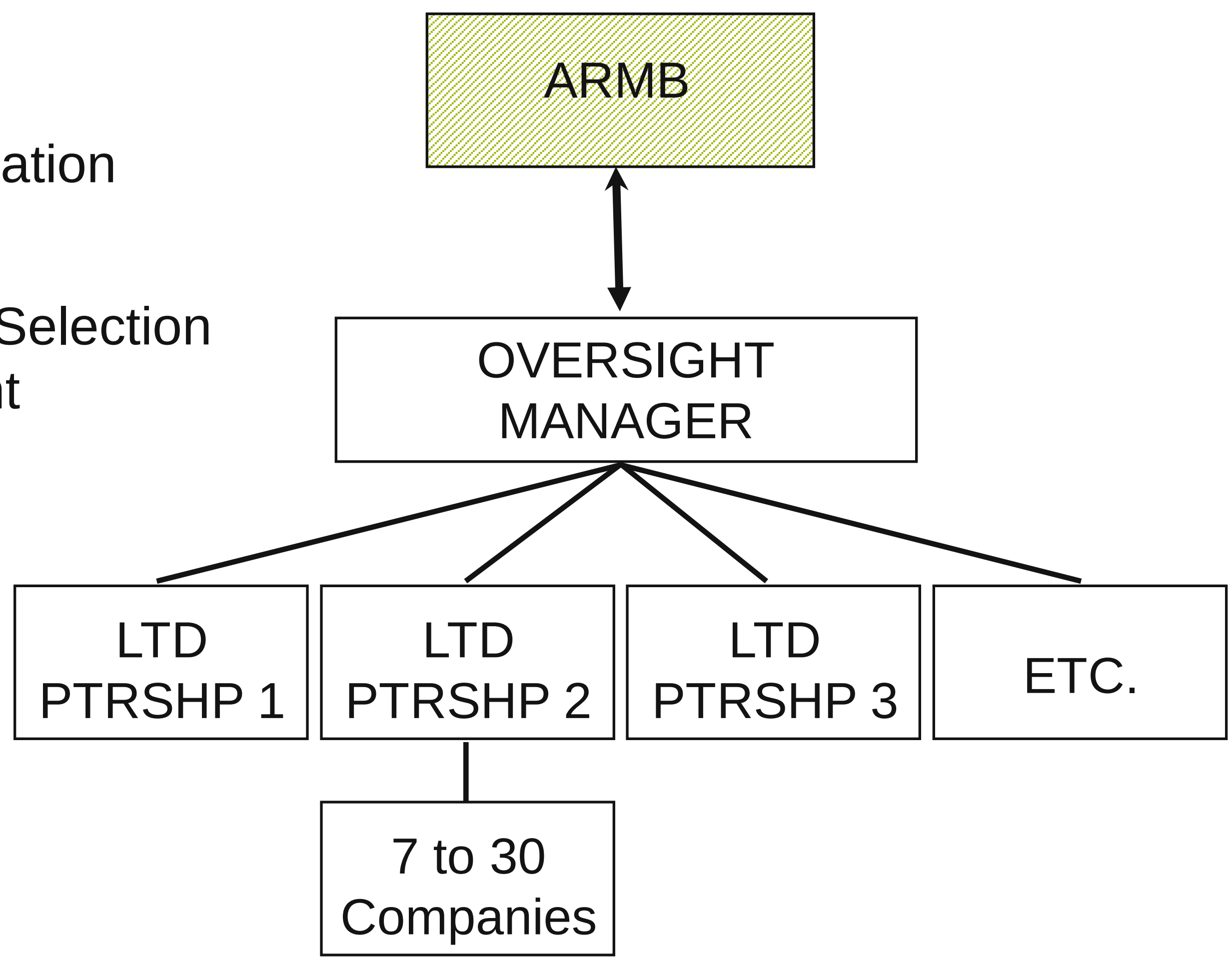
Private Equity Partnerships Program Structure

Policy
Strategic Planning
Performance Evaluation

Proactive Security Selection
Active Management
Reporting

Mini-Conglomerate
(Security)

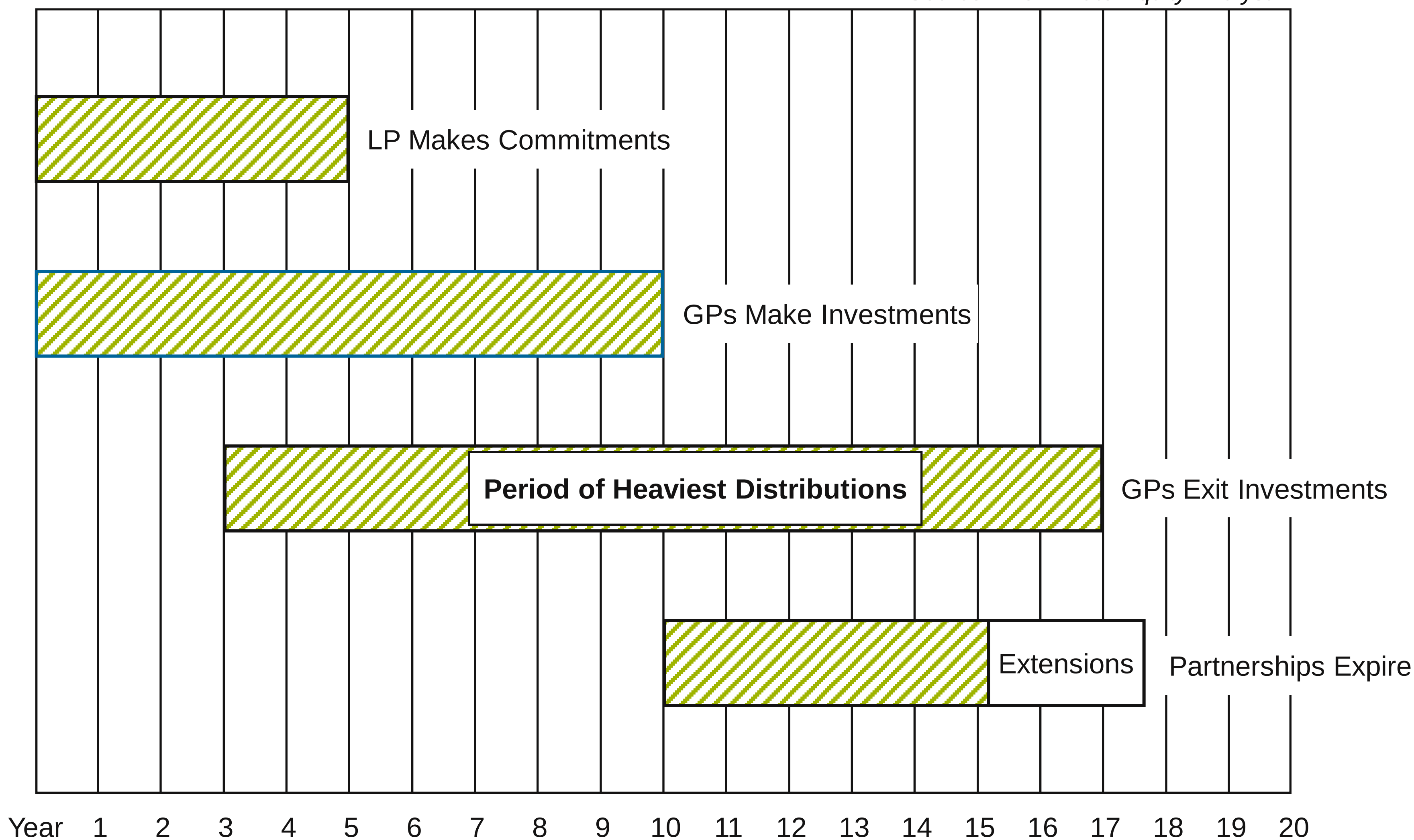
Divisions



How Private Equity Works

A Private Equity Investment Program Requires a Long-Term Horizon

Source: *The Private Equity Analyst*



ISO 27001 / 27002 Assessment

by World Wide Technologies, Inc.

December 2020

Agenda

- Information Security Value
- Who is ISO
- Who is WWT
- Treasury ISO 27001 and 27002 Assessment
- Take Aways
- Questions

Information Security Value

Understanding the Treasury’s current posture and what we are doing to address gaps that exist in information security helps the Board:

- Fulfill its fiduciary duty
- Have comfort that staff have adequate safeguards in place to prevent security events
- Have confidence that staff will be able to adequately address an event when it inevitably occurs

Who is ISO

- International Organization of Standardization (ISO) was formed in 1946

- Independent, non-governmental international organization with a membership of 165 national standards bodies
  - Headquartered in Switzerland
  - There is only one member per country

- Develops voluntary International Standards that support innovation and provide solutions to global challenges
  - World leader with over 23,000 standards set
  - Cover everything from manufactured products and technology to food safety, agriculture, and healthcare

NOTE: Because 'International Organization for Standardization' would have different acronyms in different languages (IOS in English, OIN in French for *Organisation internationale de normalisation*), the founders decided to give it the short form ISO. ISO is derived from the Greek 'isos', meaning equal. Whatever the country, whatever the language, we are always ISO.

ISO Standards 27001 and 27002

- ISO 27001 specifies the requirements for establishing, implementing, maintaining, and continually improving an information security management system (ISMS)
  - Contains seven (7) domains
  - Framework

- ISO 27002 provides supplementary guidelines on the selection, implementation, and management of security controls listed in Annex A of ISO 27001
  - Contains 14 domains
  - Process

Who is World Wide Technologies (WWT)

- Founded in 1990, WWT provides technology and supply chain services with a focus on the enterprise commercial, public, and telecom service provider sectors
- The company provides planning, procurement, and deployment of IT products and solution selling
- More than 70 Fortune 100 companies as customers
- Employs more than 6,500 throughout the world

The New Paradigm – Monetary Policy 3

November 2020

One Glendinning Place
Westport, CT 06880
(203) 226-3030
www.bridgewater.com

The New Paradigm

KEY TOPICS ON THE NEW POLICY PARADIGM – MP3

- What MP3 means
  - Inevitability, timing, and likely persistence
- Inflation
  - Time to seriously consider the possibility
- Zero bond yields
  - Not (just) a “bond problem”
- This is a very unfamiliar world, what can investors do?
  - Plenty

STIMULATION HAS TO HAPPEN DIFFERENTLY NOW; CENTRAL BANKS PRINT IT, GOVERNMENTS SPEND IT

Channels by which MP1, MP2 & MP3 Stimulate Spending

Monetary Policy 1
(interest rate policy)
→
Borrowers
(interest rate induced spending)

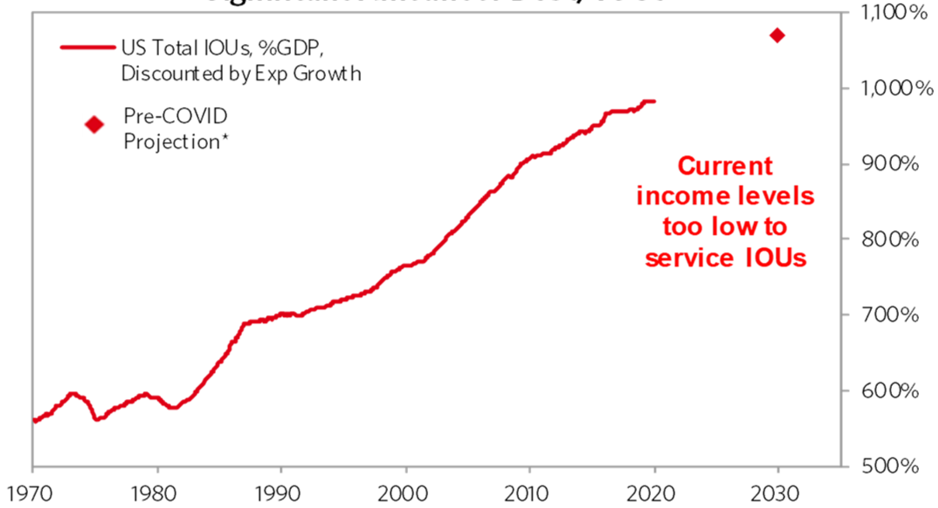
Monetary Policy 2
(QE)
→
Savers
(asset/liquidity induced spending)

Monetary Policy 3
(coordinated fiscal-monetary actions)
→
Spenders
(direct spending financed by money printing)

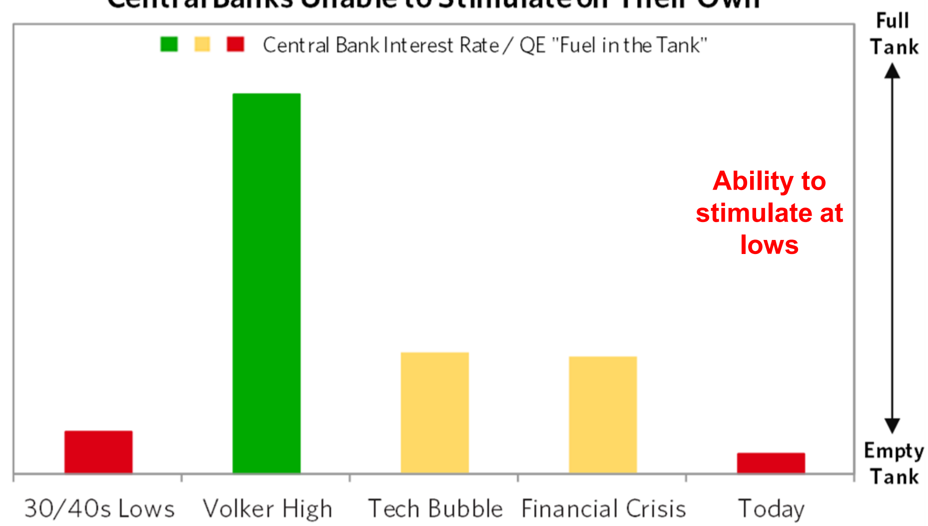
Please review the "Important Disclosures and Other Information" located at the end of this presentation.

SECULAR IMBALANCES CREATING THE NEED FOR A NEW PARADIGM

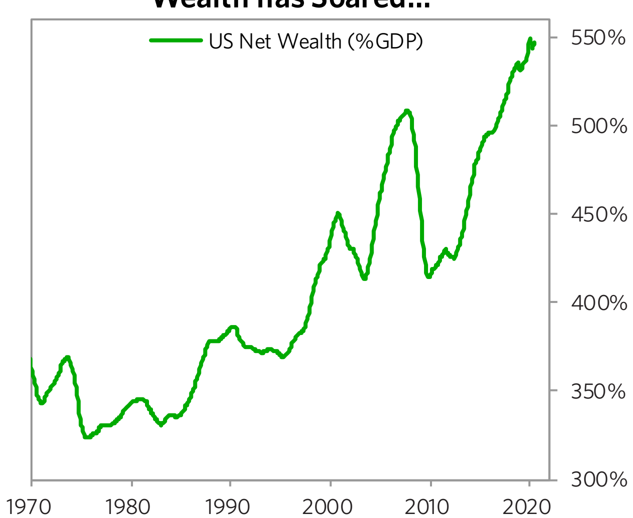
Significant Amount of Debt/IOUs



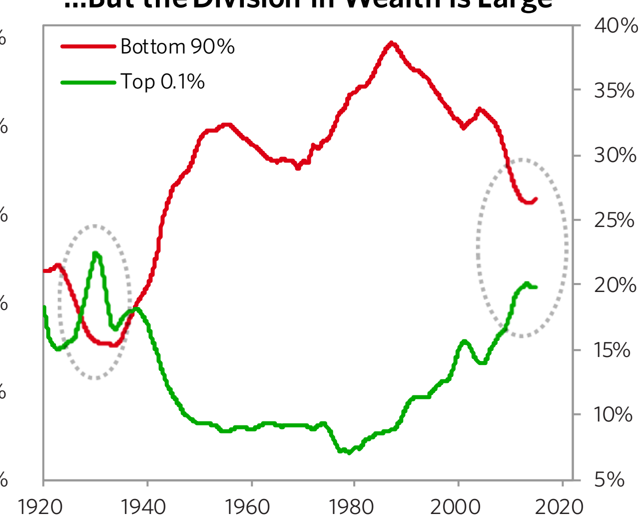
Central Banks Unable to Stimulate on Their Own



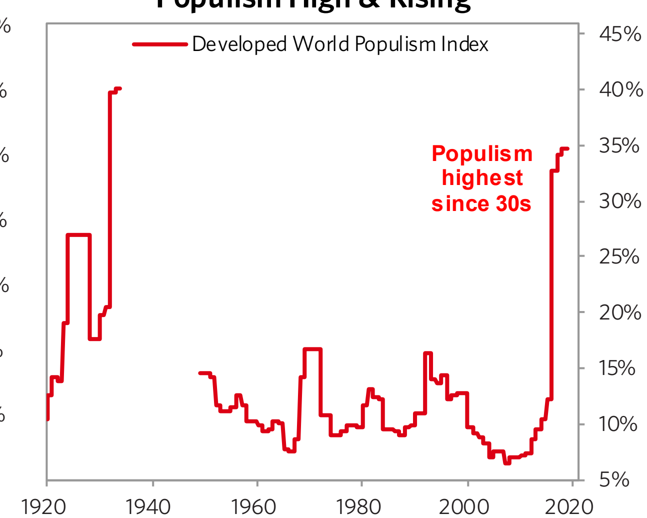
Wealth has Soared...



...But the Division in Wealth is Large

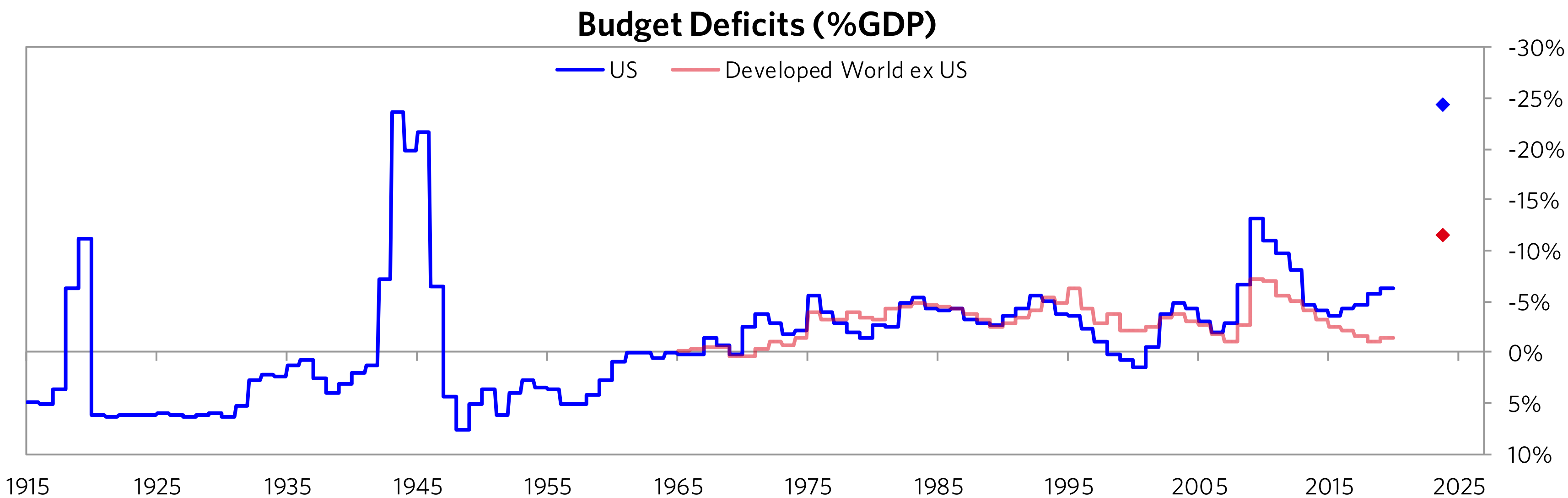


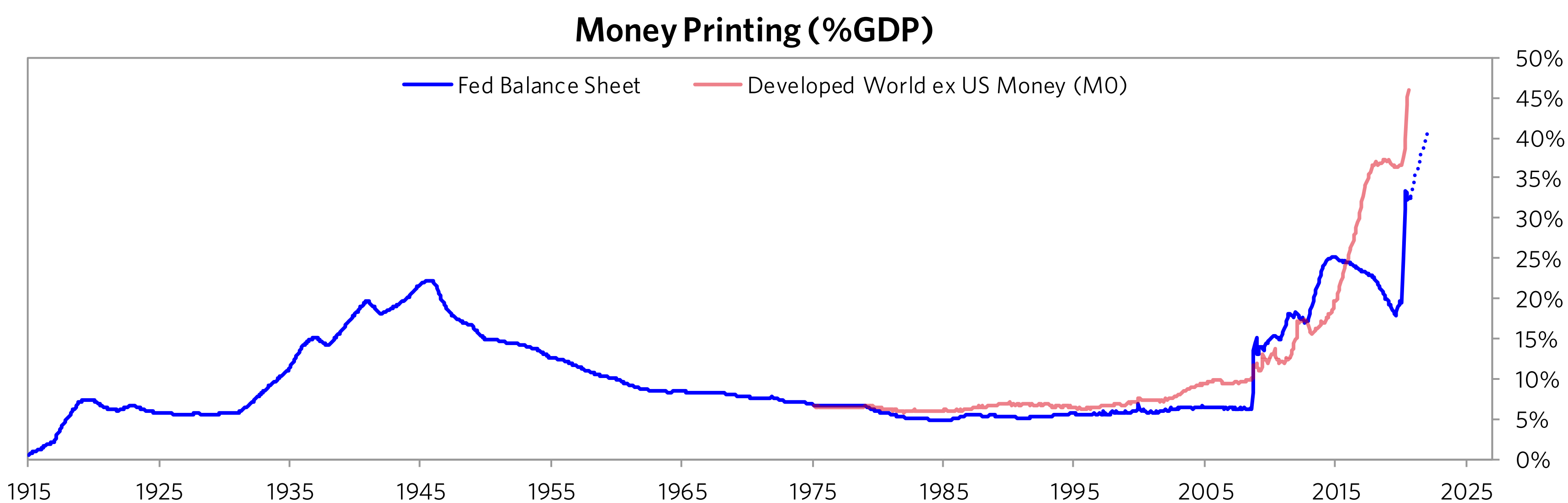
Populism High & Rising



Estimates are based on Bridgewater analysis. Please review the "Important Disclosures and Other Information" located at the end of this presentation.

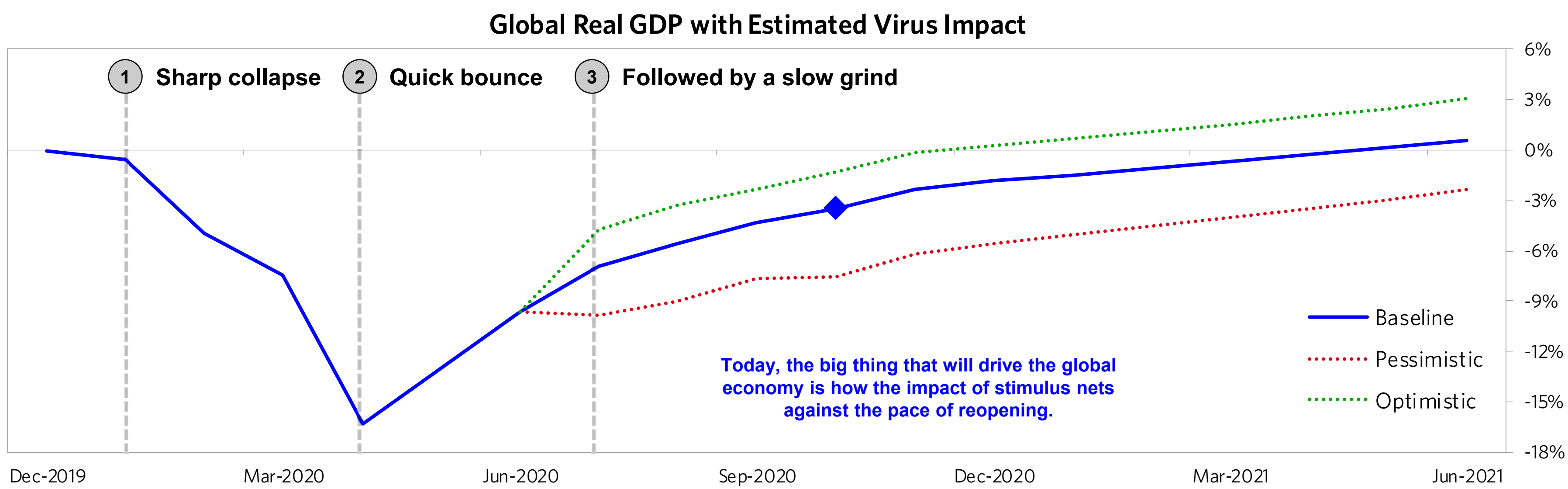
THE MP3 RESPONSE HAS BEEN MASSIVE GLOBALLY

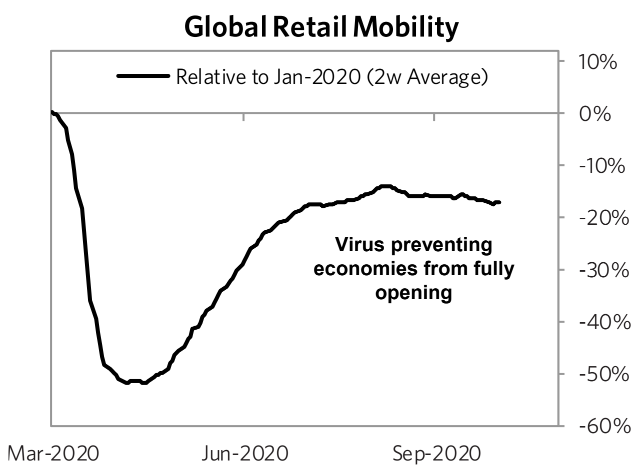


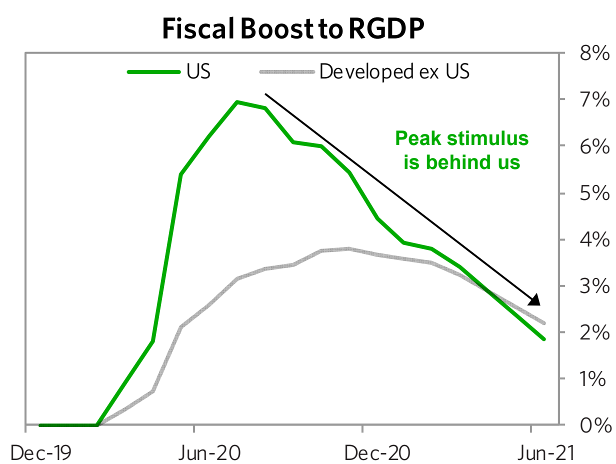


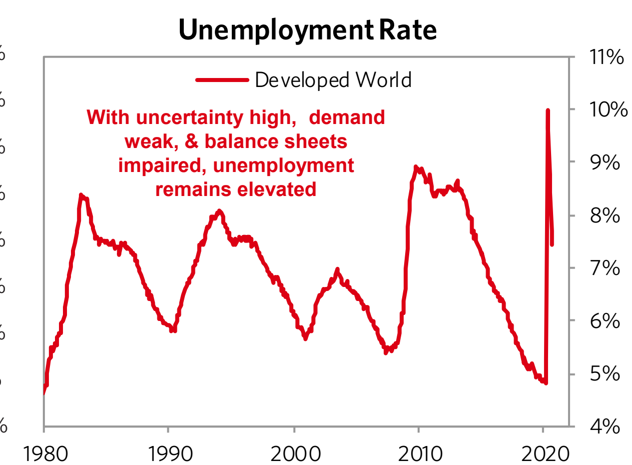
Estimates based on Bridgewater analysis. Note: dots in the top charts are BW estimates; dotted line in the bottom chart represents estimated scale of money printing. Please review the "Important Disclosures and Other Information" located at the end of this presentation.

GIVEN THE FRAGILITY OF THE RECOVERY, A LOT MORE STIMULUS WILL BE NEEDED





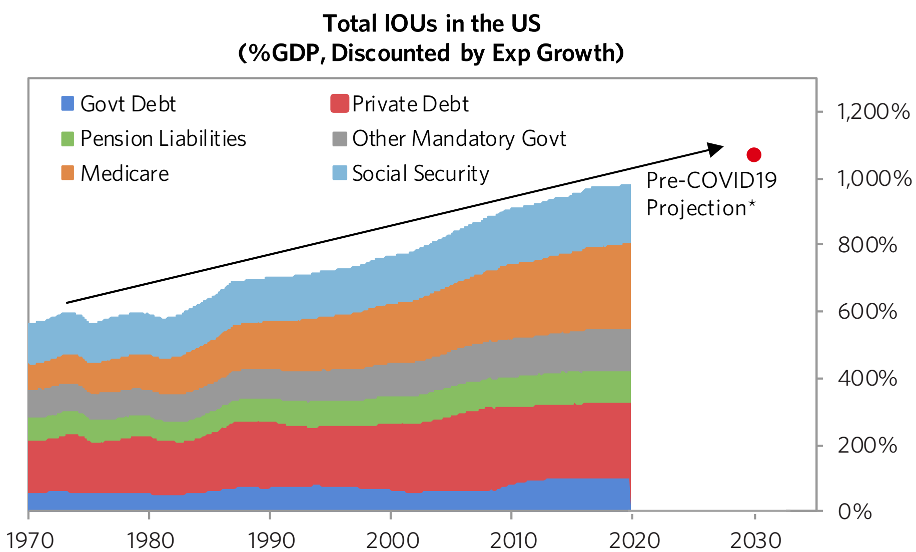




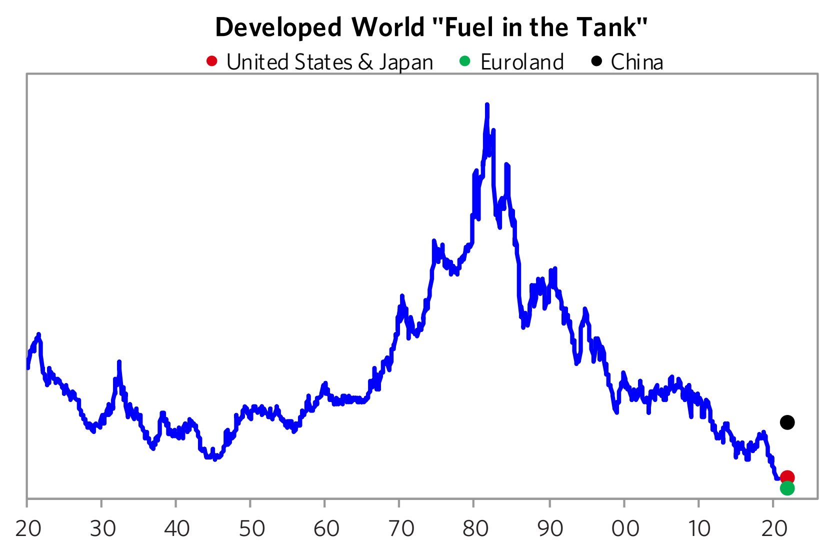
Updated October 2020. Growth estimates based on Bridgewater analysis. Please review the "Important Disclosures and Other Information" located at the end of this presentation.

SUSTAINED STIMULUS NEEDED TO MANAGE DEBT BURDENS

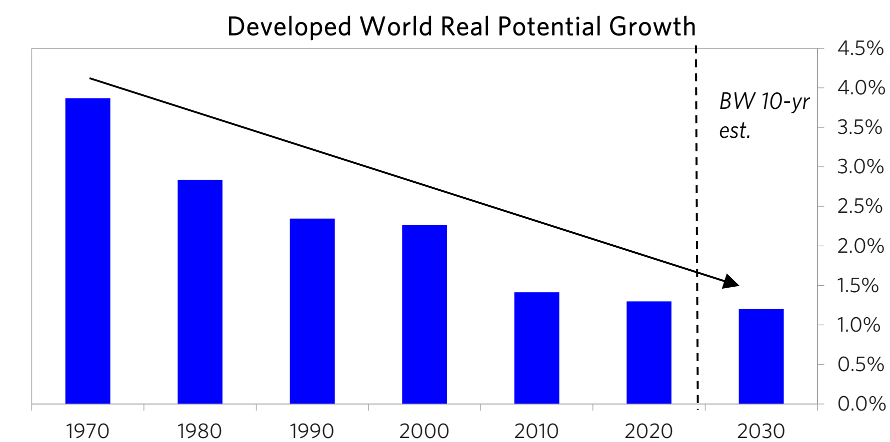
Too Many Promises

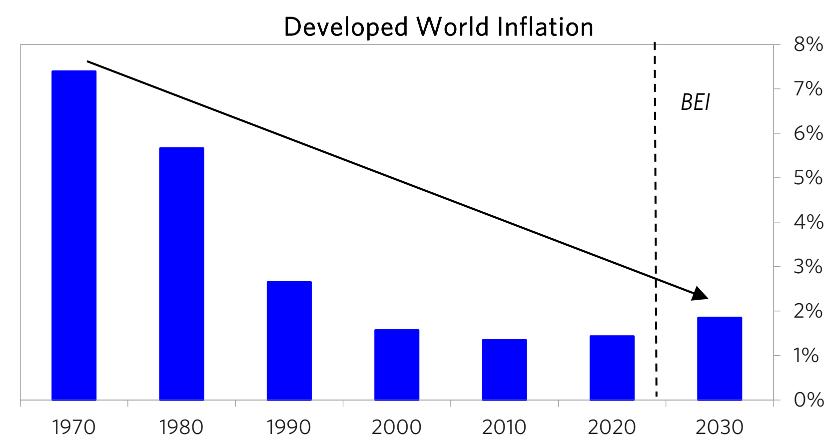


Interest Rates & QE Exhausted



Not Enough Income to Reduce Debt Burdens and Close the Income Gap





*Note: IOU chart updated with data available through July 2019. Medicare, Social Security, and other government programs represent the present value of estimates of future outlays from the Congressional Budget Office. Of course, some of the IOUs have assets or cash flows partially backing them (like tax revenue covering some Social Security outlays). 10-year forward projections are based on government projections of public debt and social welfare payments. Estimates are based on Bridgewater analysis. Please review the "Important Disclosures and Other Information" located at the end of this presentation.

FORCES THAT DROVE LOW INFLATION ARE SHIFTING

Price = Total $ (Money, Credit) / Total Q (Goods & Services)

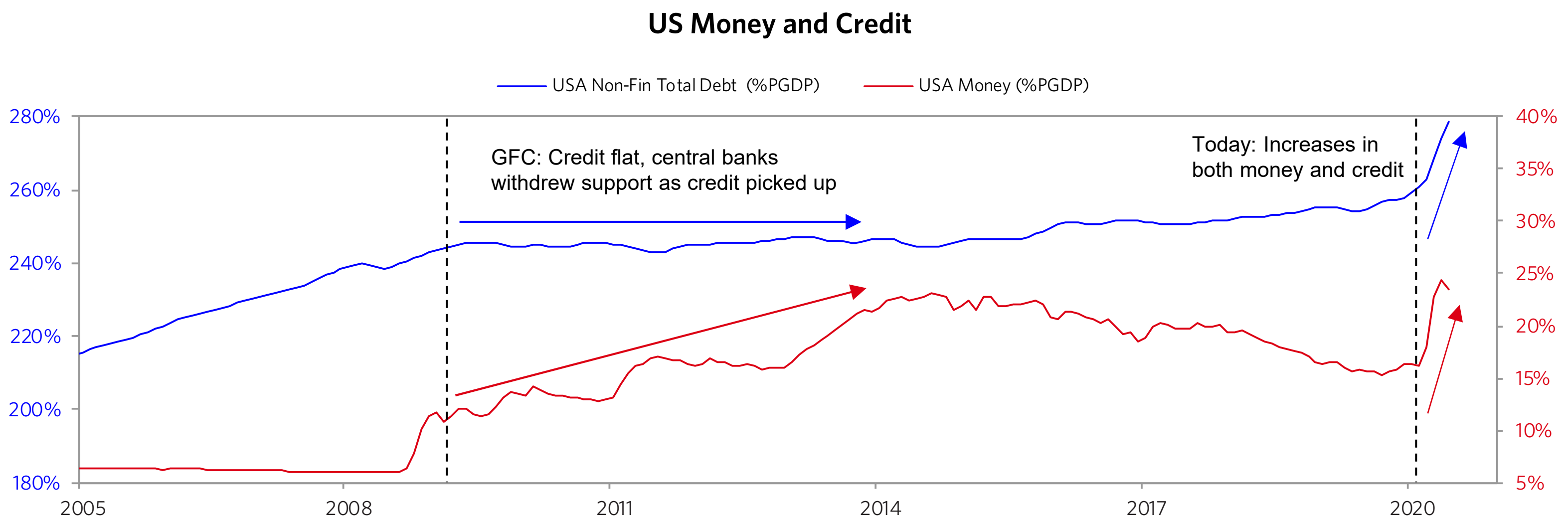
Looking Back

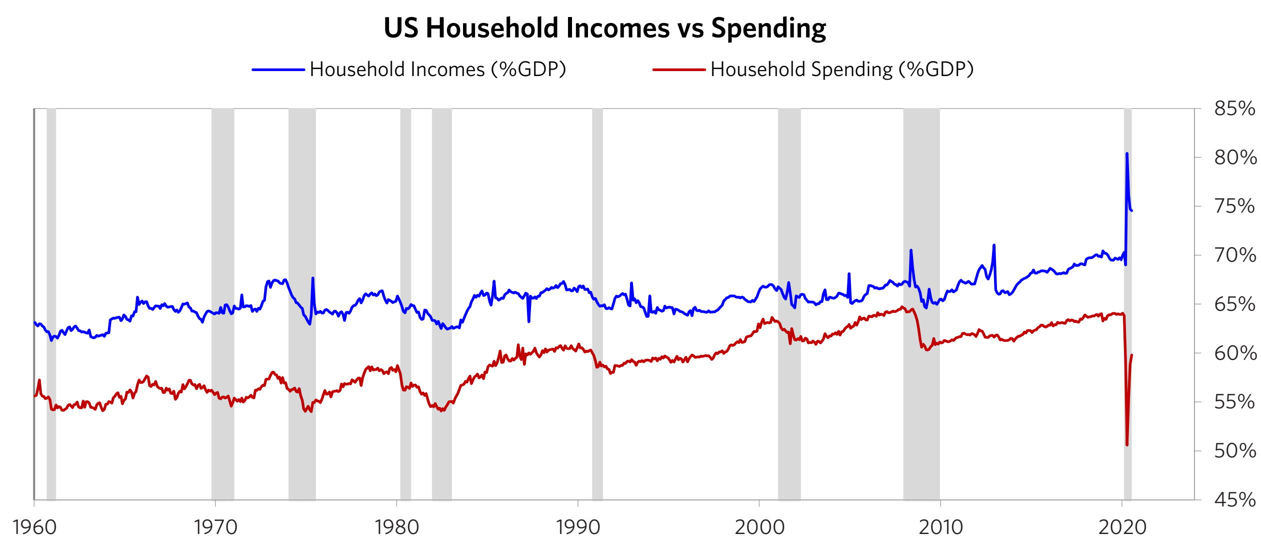
- Central banks limiting money and credit to target low inflation ($ ▼)
- Rise in globalization (Q ▲)
- Technology improvements (Q ▲)
- Pro-business environment ($ ▼)

Looking Ahead

- Central banks providing massive liquidity
- Uncertain future for globalization
- Technology likely to remain deflationary
- Will the pro-business environment persist?

IMPLICATIONS FOR INFLATION: MP2 VS. MP3



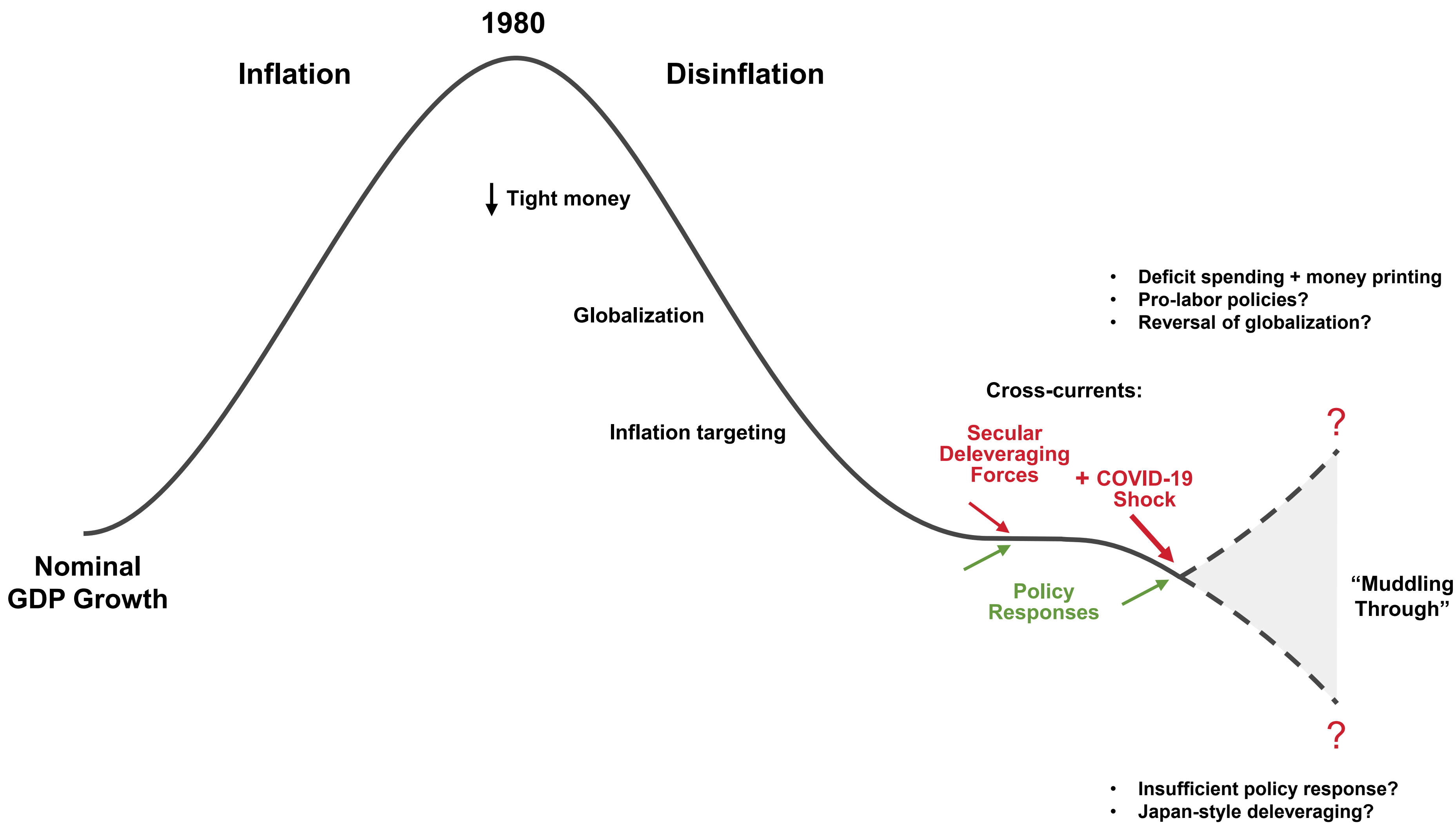


First time in modern history that incomes increased during a recession — incomes have been supported by a spike in government transfers to households. Much of it was saved; the dry powder could turn into a surge in future spending.

Note: recessions highlighted in gray

USA non-financial total debt figures in the top chart are through June 2020. Income and spending figures are as of September 2020. Please review the “Important Disclosures and Other Information” located at the end of this presentation.

A WIDE RANGE OF POSSIBLE OUTCOMES, WITH INCREASED RISK OF INFLATION



This exhibit is a conceptual illustration. Please review the "Important Disclosures and Other Information" located at the end of this presentation.

DOES MP3 MEAN REFLATION OR STAGFLATION? DIVERSIFY AGAINST BOTH OUTCOMES

Excess Returns at 10% Volatility (Ann.)

		Growth vs Exp	Inflation vs Exp	Equities	Bonds	IL Bonds	Gold	60/40 Portfolio	Balanced Portfolio w/o Nom. Bonds
Stagflation	UK 1970-1979	↓	↑	1.4%	-0.3%	14.5%	12.6%	1.3%	14.6%
	US 1971-1979	↓	↑	0.0%	-2.3%	7.2%	15.4%	-0.5%	10.5%
Successful Reflation	US 1940-1951	↑	↑	6.9%	5.0%	12.7%	0.3%	7.7%	11.5%
	UK 1947-1959	↑	↑	6.2%	0.1%	4.7%	-0.4%	6.1%	6.7%
	US 2008-2012	↑	↑	4.0%	11.7%	17.6%	9.7%	6.8%	15.9%
	UK 2008-2012	↑	↑	3.8%	12.9%	13.4%	11.5%	6.5%	15.1%
Insufficient Stimulation	US 1936-1939	↓	↓	0.7%	8.7%	7.1%	-0.1%	2.7%	4.2%
	EU 2008-2012	↓	↓	-1.1%	7.7%	11.0%	11.7%	0.5%	8.5%
	JP 2008-2012	↓	↓	-2.1%	7.2%	10.2%	5.0%	-1.4%	3.8%
	JP 1994-2003	↓	↓	-1.4%	8.7%	7.9%	-0.1%	-0.6%	1.8%
Deflationary Depression	US 1929-1933	↓	↓	-18.4%	6.0%	-15.6%	-0.9%	-16.3%	-19.9%
	Avg. Returns	-	-	0.0%	5.9%	8.2%	5.9%	1.2%	6.6%
	Avg. Worst Drawdown	-	-	-29.4%	-17.9%	-18.3%	-14.9%	-28.6%	-22.2%

(1) (2) (3) (1)

Unlikely – policy makers committed to doing whatever it takes to avoid

(1) If MP3 leads to inflation without real growth, or there is insufficient stimulation, equities will likely struggle.

(2) In inflationary environments, real assets like gold and ILs are often the best storehold of wealth.

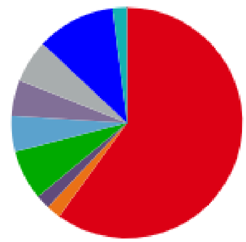
(3) Successful reflation can lead to good nominal asset returns, but real returns can be much lower, making inflation protection especially important.

Information shown is the result of analyses of actual and simulated market data. "60/40 Portfolio" refers to 60% equities and 40% bonds of the country listed. "Balanced Portfolio without Nominal Bonds" refers to a portfolio of risk-matched stocks and equal risk-weighted IL bonds and gold. Past performance is not indicative of future results. Please review the "Important Disclosures and Other Information" located at the end of this presentation.

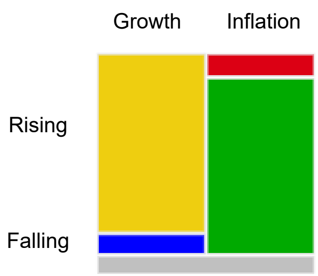
Strategic Portfolio Implications

PORTFOLIO LEVERS TO PROVIDE RETURN AND DIVERSIFICATION

Illustrative Portfolio Capital Share

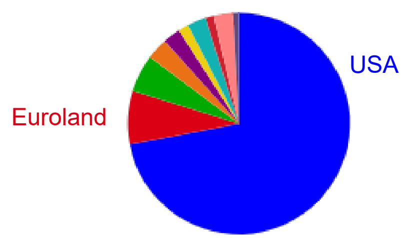


(1) Environmental Risk



- Stagflation & Inflation Protection Assets: IL Bonds + Gold
- Shifting allocations to where bonds have room to rally

(2) Geographic Risk



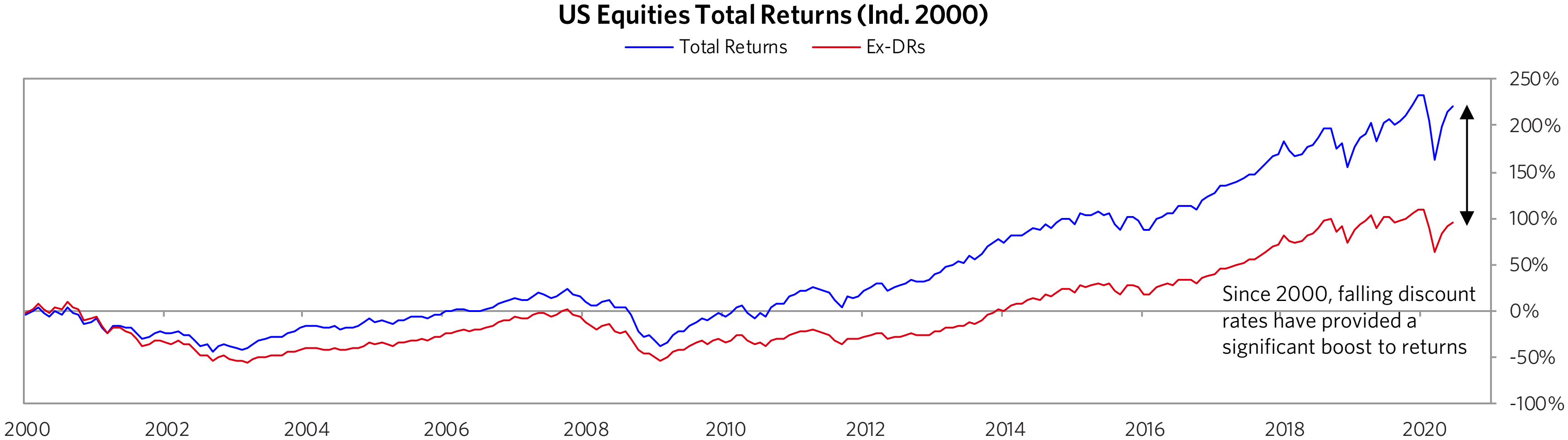
- Geographic Diversification
- Tri-Polar Diversification

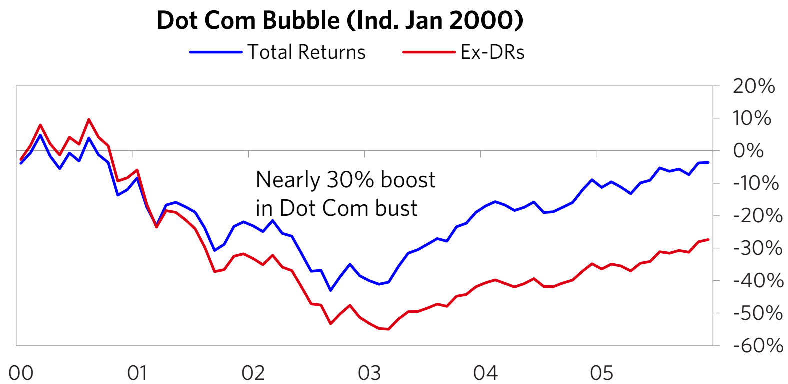
(3) Active Risk

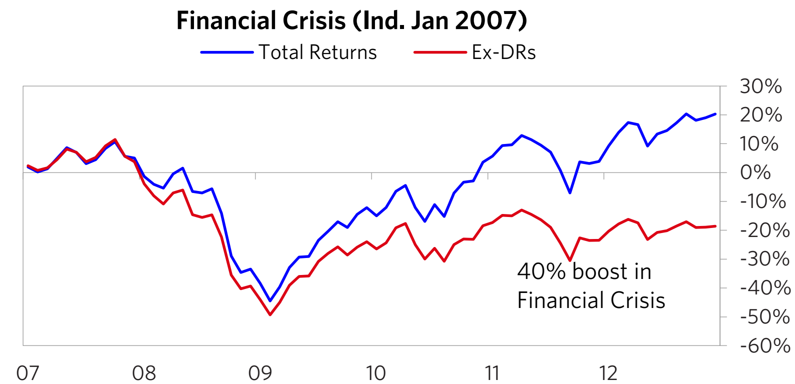
- Alpha Overlay – maximize opportunity for returns, diversification, and capital efficiency

For more information on the Illustrative Portfolio, please see the Illustrative Base Portfolio disclosure located at the end of the presentation. Risk shares shown in var terms. Please review the "Important Disclosures and Other Information" located at the end of this presentation.

ZERO YIELDS ARE NOT JUST A BOND PROBLEM, THEY MAKE ALL ASSETS RISKIER





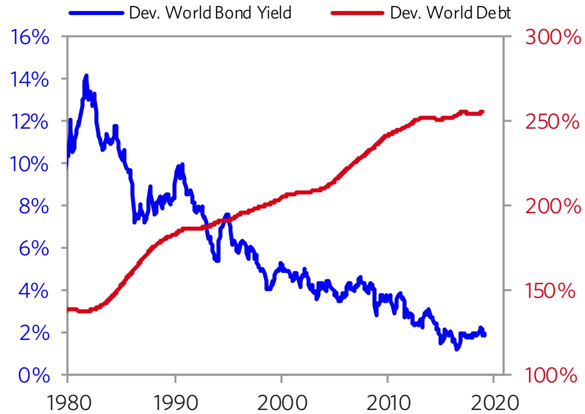


Data through June 2020. Please review the "Important Disclosures and Other Information" located at the end of this presentation.

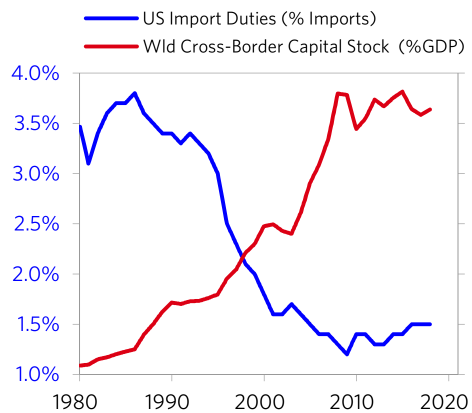
WITH SECULAR SUPPORTS FOR EQUITIES LIKELY NEAR THEIR LIMITS, DIVERSIFICATION IS MORE IMPORTANT THAN EVER

DEBT, INTEREST RATES & GLOBALIZATION

Lower Interest Rates Have Supported Debt Growth

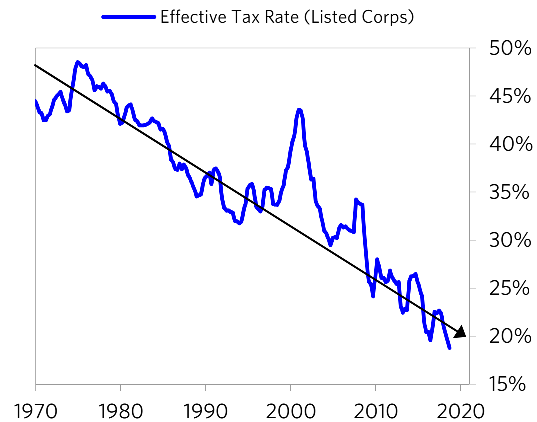


Globalization Has Enhanced Productivity & Lowered Inflation

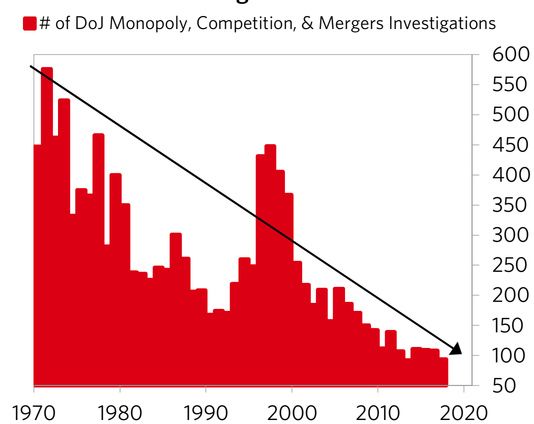


COSTS OF DOING BUSINESS

Corporate Taxes

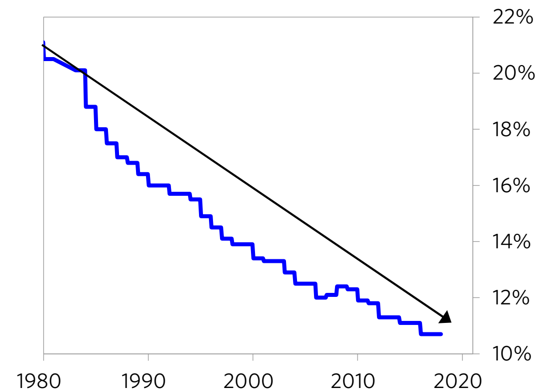


Deregulation

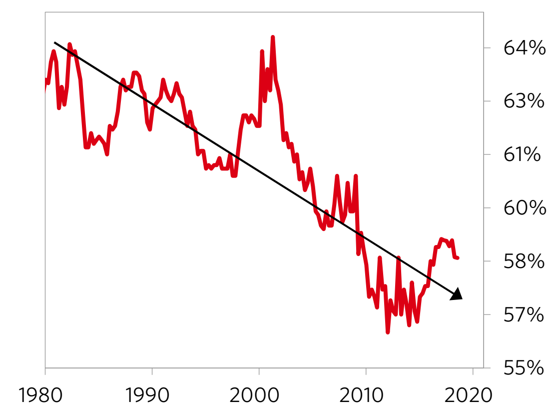


SHRINKING POWER OF LABOR

Union Members (% Labor Force)



Labor Share of Output

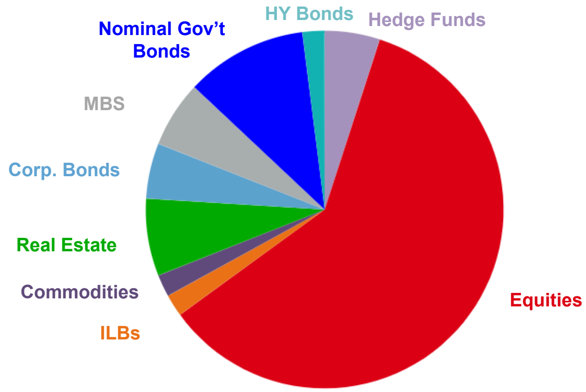


Dev. world debt shows non-financial debt as a share of GDP. Data as of July 2019. Please review the "Important Disclosures and Other Information" located at the end of this presentation.

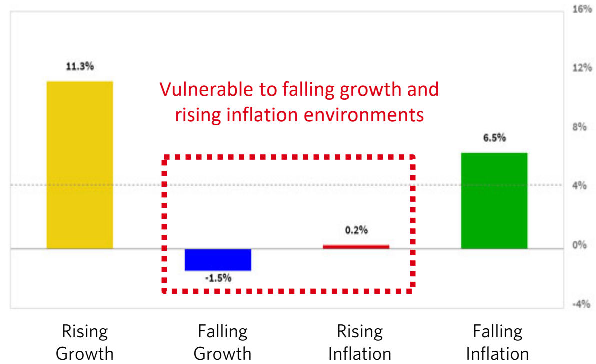
IL BONDS AND GOLD HELP OFFSET THE VULNERABILITIES OF EQUITY-HEAVY PORTFOLIOS

Illustrative Base Portfolio

Capital Allocation

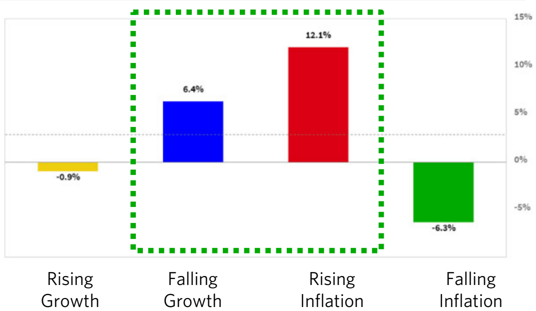


Excess Returns Across US Economic Environments (since 1970, sim., beta only)

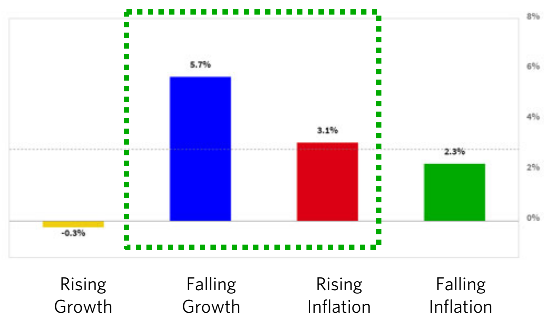


Excess Returns Across US Economic Environments (since 1970)

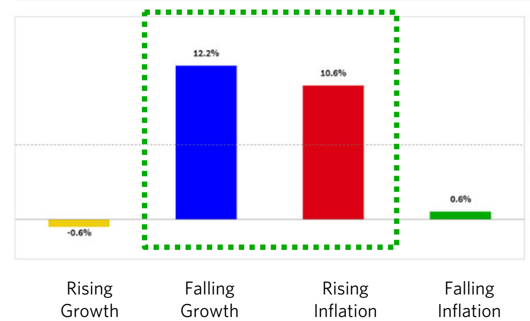
Gold



ILBs



Risk-Matched Gold + ILBs



Data as of August 2020. More detailed information for the "Illustrative Base Portfolio" is available in the disclosure page for "Illustrative Base Portfolio". Risk-Matched Gold + ILBs composed of 154.5% nominal exposure to currency hedged developed world IL bonds, 45.5% nominal exposure to gold. "ILBs" composed of a 100% exposure to currency hedged developed world IL bonds. A rising (falling) inflation month is defined by comparing coincident inflation with recent trend and combining that with a proprietary market-based measure of changes in future market discounting. A rising (falling) growth month is defined by comparing coincident growth with recent trend and combining that with a proprietary market-based measure of changes in future market discounting. HYPOTHETICAL PERFORMANCE RESULTS HAVE MANY INHERENT LIMITATIONS, SOME OF WHICH ARE DESCRIBED BELOW. NO REPRESENTATION IS BEING MADE THAT ANY ACCOUNT WILL OR IS LIKELY TO ACHIEVE PROFITS OR LOSSES SIMILAR TO THOSE SHOWN. IN FACT, THERE ARE FREQUENTLY SHARP DIFFERENCES BETWEEN HYPOTHETICAL PERFORMANCE RESULTS AND THE ACTUAL RESULTS SUBSEQUENTLY ACHIEVED BY ANY PARTICULAR TRADING PROGRAM. ONE OF THE LIMITATIONS OF HYPOTHETICAL PERFORMANCE RESULTS IS THAT THEY ARE GENERALLY PREPARED WITH THE BENEFIT OF HINDSIGHT. IN ADDITION, HYPOTHETICAL TRADING DOES NOT INVOLVE FINANCIAL RISK, AND NO HYPOTHETICAL TRADING RECORD CAN COMPLETELY ACCOUNT FOR THE IMPACT OF FINANCIAL RISK IN ACTUAL TRADING. FOR EXAMPLE, THE ABILITY TO WITHSTAND LOSSES OR TO ADHERE TO A PARTICULAR TRADING PROGRAM IN SPITE OF TRADING LOSSES ARE MATERIAL POINTS WHICH CAN ALSO ADVERSELY AFFECT ACTUAL TRADING RESULTS. THERE ARE NUMEROUS OTHER FACTORS RELATED TO THE MARKETS IN GENERAL OR TO THE IMPLEMENTATION OF ANY SPECIFIC TRADING PROGRAM WHICH CANNOT BE FULLY ACCOUNTED FOR IN THE PREPARATION OF HYPOTHETICAL PERFORMANCE RESULTS AND ALL OF WHICH CAN ADVERSELY AFFECT ACTUAL TRADING RESULTS. Past performance is not indicative of future results. Please review the "Important Disclosures and Other Information" located at the end of this presentation.

COUNTRY OUTPERFORMANCE SHOULD NOT BE EXTRAPOLATED

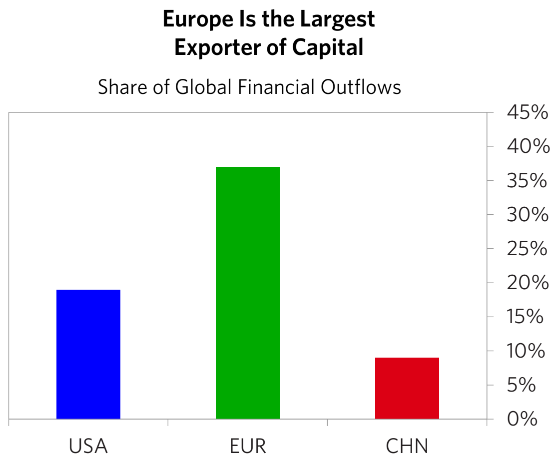
Rankings of Equity Excess Returns (Hedged) By Decade

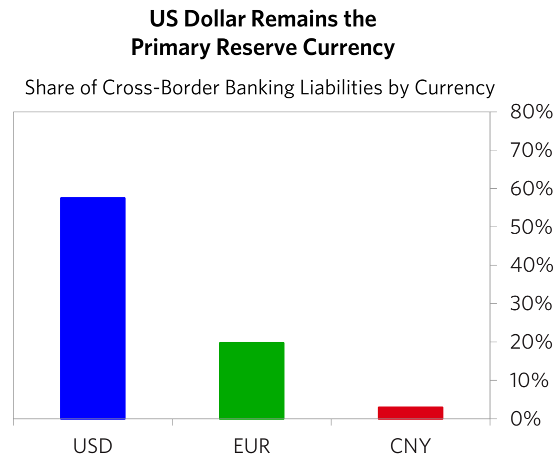
2010s		2000s		1990s		1980s		1970s		1960s	
USA	**235%**	CHN	76%	CHE	231%	SWE	503%	KOR	456%	ESP	312%
NZL	209%	NOR	48%	**USA**	**217%**	KOR*	354%	JPN	66%	AUS	148%
SWE	198%	BRZ	45%	SWE*	190%	JPN	310%	CAN	30%	**Equal Weight**	**75%**
CHE	140%	CAN	42%	FRA	117%	ESP	188%	**Equal Weight**	**10%**	JPN	74%
DEU	139%	AUS	36%	GBR	110%	**Equal Weight**	**185%**	GBR	8%	CAN	71%
FRA	137%	KOR	22%	ESP	96%	DEU	179%	CHE	-5%	**USA**	**41%**
JPN	135%	ESP	17%	DEU	92%	GBR	173%	AUS	-12%	SWE	31%
GBR	105%	**Equal Weight**	**6%**	AUS	59%	ITA	169%	**USA**	**-17%**	GBR	28%
TAI	98%	NZL	-3%	**Equal Weight**	**53%**	FRA	158%	FRA	-20%	DEU*	21%
Equal Weight	**97%**	CHE*	-4%	CAN	52%	CHE	96%	SWE	-22%	ITA	-1%
NOR	95%	SWE	-13%	ITA	40%	**USA**	**96%**	DEU	-31%	FRA	-6%
CAN	70%	TAI	-23%	NOR	2%	AUS	39%	ESP*	-69%		
RUS	61%	GBR	-23%	NZL	-6%	NOR	23%	ITA	-74%		
AUS	61%	**USA**	**-27%**	JPN	-47%	CAN	-4%				
ITA	48%	FRA	-32%	TAI	-49%						
KOR	33%	ITA	-35%	KOR	-66%						
ESP	23%	DEU	-36%								
CHN*	10%	JPN	-41%								
BRZ	-13%										

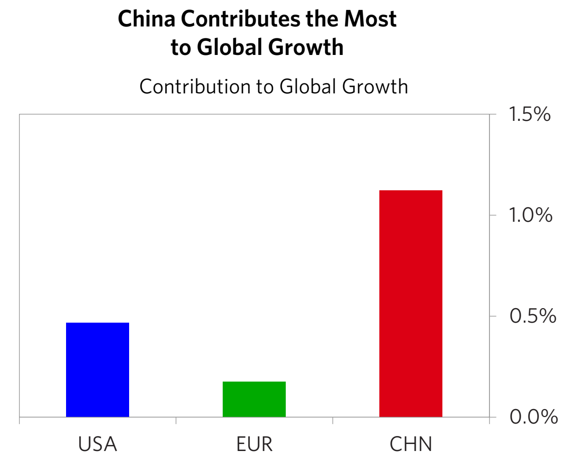
1950s		1940s		1930s		1920s		1910s		1900s	
DEU	739%	ESP	140%	GBR	6%	**Equal Weight**	**249%**	**USA***	**10%**	**USA**	**83%**
JPN	662%	**Equal Weight**	**138%**	DEU	2%	DEU	178%	FRA	-35%	**Equal Weight**	**9%**
ITA	484%	AUS	132%	CAN	-9%	**USA***	**170%**	GBR	-44%	FRA	9%
FRA	484%	**USA**	**122%**	**Equal Weight***	**-10%**	CAN	134%	**Equal Weight**	**-54%**	DEU	9%
Equal Weight	**384%**	GBR*	117%	**USA**	**-12%**	GBR	87%	DEU	-92%	RUS	-7%
USA	**376%**	CAN	115%	SWE	-22%	ESP	72%	RUS	-100%	GBR	-34%
AUS	277%	SWE	100%	FRA	-54%	FRA	41%				
GBR	270%	FRA	-19%	ESP	-61%	SWE	24%				
SWE	240%	DEU	-35%								
CAN	222%										
ESP*	98%										

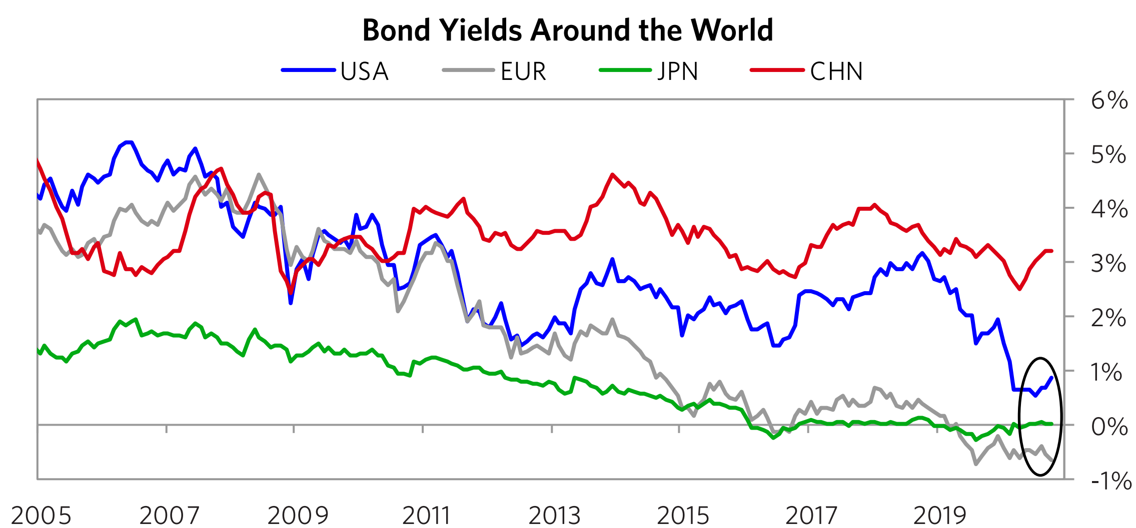
*Denotes the best performer of the prior decade. [1]China equities start in 2001.
Data through December 2019. Past performance is not indicative of future results. Please review the "Important Disclosures and Other Information" located at the end of this document.

GEOGRAPHIC DIVERSIFICATION IS INCREASINGLY IMPORTANT





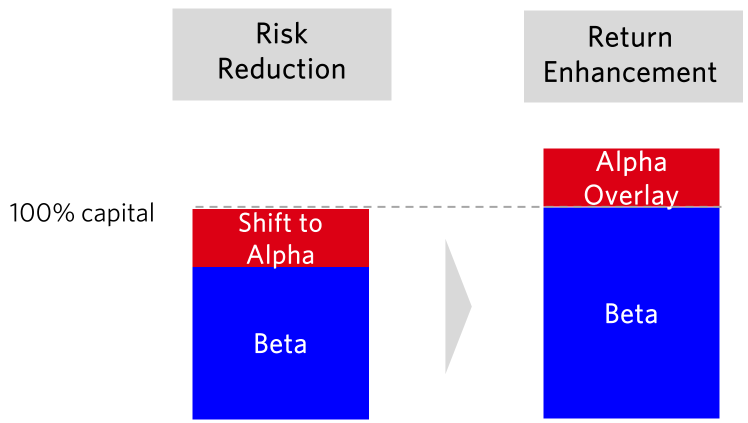




Top charts as of 2019, bottom chart as of October 31, 2020. Please review the "Important Disclosures and Other Information" located at the end of this presentation.

GOOD, DIVERSIFYING ALPHA CAN BE KEY

Alpha Can Be Used For Risk Reduction / Return Enhancement

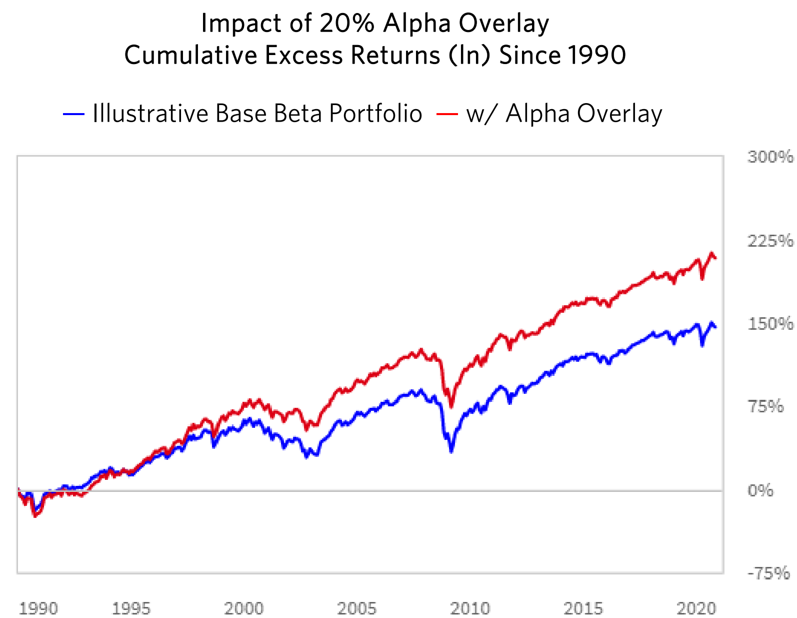


Impact of Adding 0.70 Ratio Alpha to a Portfolio		With 20% Shift to Alpha	With 20% Alpha Overlay
	Return	+0.98%	+1.72%
	Risk	-2.0%	+0.23%
	Ratio	+50%	+39%

Replacing beta with good alpha **reduces risk without sacrificing returns**

Overlaying alpha **improves return without adding much risk**

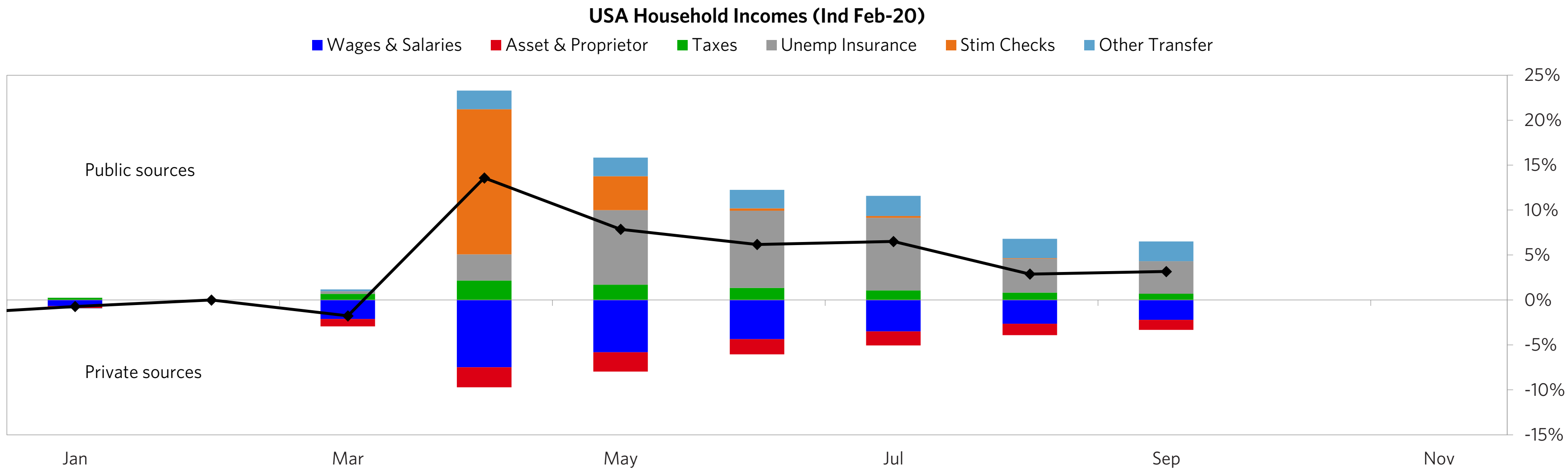
Good & Diversifying Alpha Can be Highly Impactful

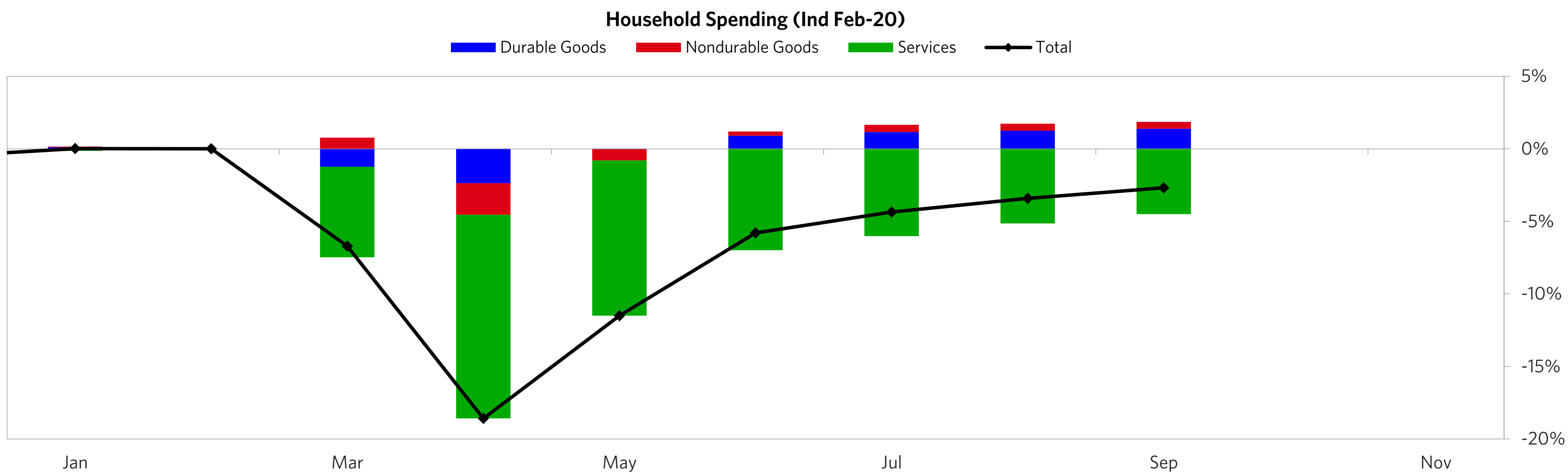


This slide is for illustrative purposes only. Asset performance updated through 10/2020. Historical performance based on the Illustrative Base Portfolio, which is simulated. Returns are based on historical excess returns, expected cash rates, and simulated alpha. Charts on left depicts expected impact of 20% to 0.7 ratio uncorrelated alpha using a shift vs overlay on the beta portion of the Illustrative Base portfolio. Chart on right depicts impact of illustrative alpha simulated 0.7 ratio uncorrelated. More detailed information for the "Illustrative Base Portfolio" is available in the disclosure located at the end of this presentation. Beta shown gross of fees, illustrative alpha shown net of fees. HYPOTHETICAL PERFORMANCE RESULTS HAVE MANY INHERENT LIMITATIONS, SOME OF WHICH ARE DESCRIBED BELOW. NO REPRESENTATION IS BEING MADE THAT ANY ACCOUNT WILL OR IS LIKELY TO ACHIEVE PROFITS OR LOSSES SIMILAR TO THOSE SHOWN. IN FACT, THERE ARE FREQUENTLY SHARP DIFFERENCES BETWEEN HYPOTHETICAL PERFORMANCE RESULTS AND THE ACTUAL RESULTS SUBSEQUENTLY ACHIEVED BY ANY PARTICULAR TRADING PROGRAM. ONE OF THE LIMITATIONS OF HYPOTHETICAL PERFORMANCE RESULTS IS THAT THEY ARE GENERALLY PREPARED WITH THE BENEFIT OF HINDSIGHT. IN ADDITION, HYPOTHETICAL TRADING DOES NOT INVOLVE FINANCIAL RISK, AND NO HYPOTHETICAL TRADING RECORD CAN COMPLETELY ACCOUNT FOR THE IMPACT OF FINANCIAL RISK IN ACTUAL TRADING. FOR EXAMPLE, THE ABILITY TO WITHSTAND LOSSES OR TO ADHERE TO A PARTICULAR TRADING PROGRAM IN SPITE OF TRADING LOSSES ARE MATERIAL POINTS WHICH CAN ALSO ADVERSELY AFFECT ACTUAL TRADING RESULTS. THERE ARE NUMEROUS OTHER FACTORS RELATED TO THE MARKETS IN GENERAL OR TO THE IMPLEMENTATION OF ANY SPECIFIC TRADING PROGRAM WHICH CANNOT BE FULLY ACCOUNTED FOR IN THE PREPARATION OF HYPOTHETICAL PERFORMANCE RESULTS AND ALL OF WHICH CAN ADVERSELY AFFECT ACTUAL TRADING RESULTS. Past performance is not indicative of future results. There are no guarantees expected performance can or will be achieved. Please review the "Important Disclosures and Other Information" located at the end of this presentation.

Appendix

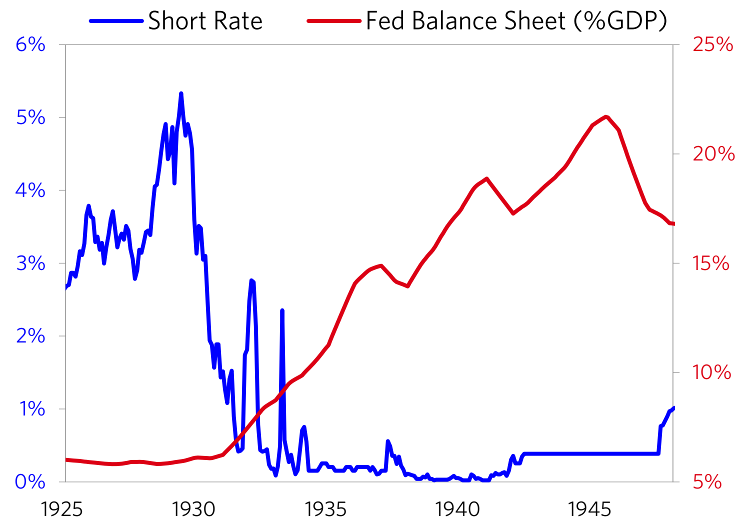
HOUSEHOLD INCOME AND SPENDING HAVE BEEN PROPPED UP BY GOVERNMENT SUPPORT

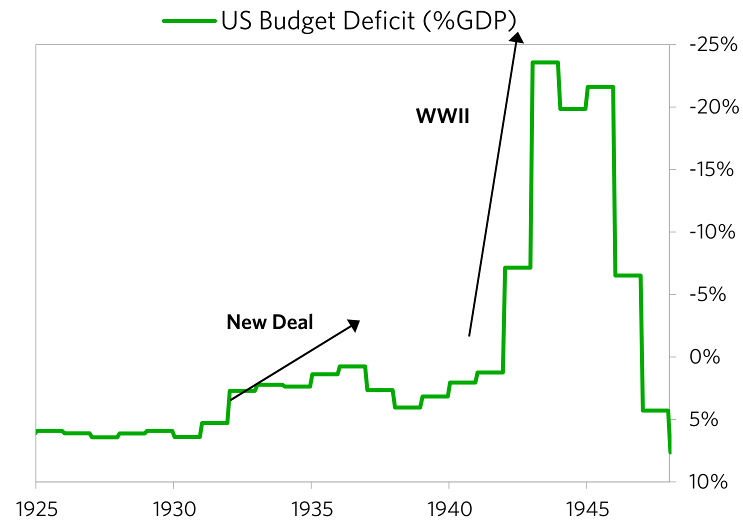


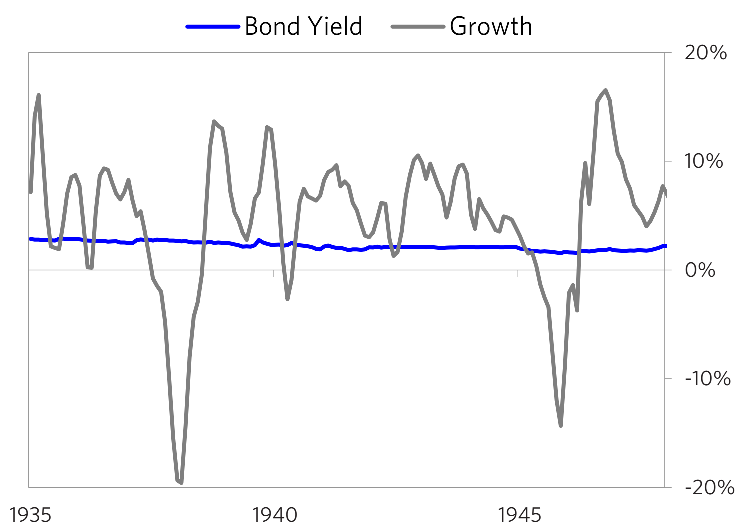


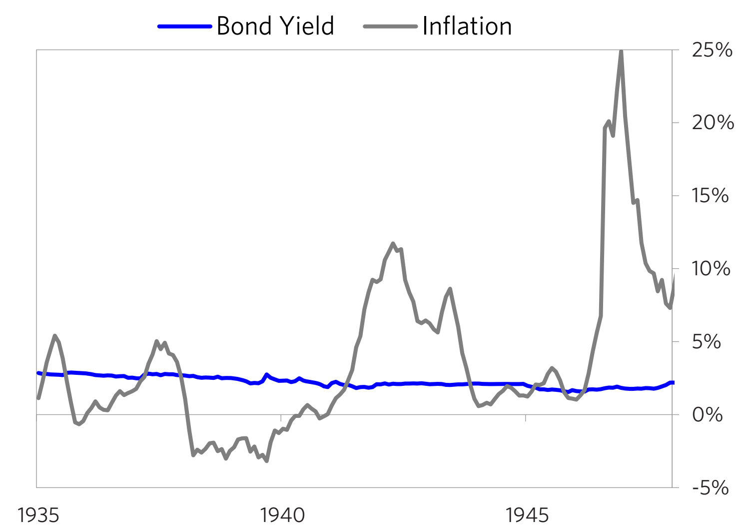
Data as of 9/30/2020. Please review the "Important Disclosures and Other Information" located at the end of this presentation.

TODAY'S POLICIES ARE SIMILAR TO THE US IN THE 1930/40s

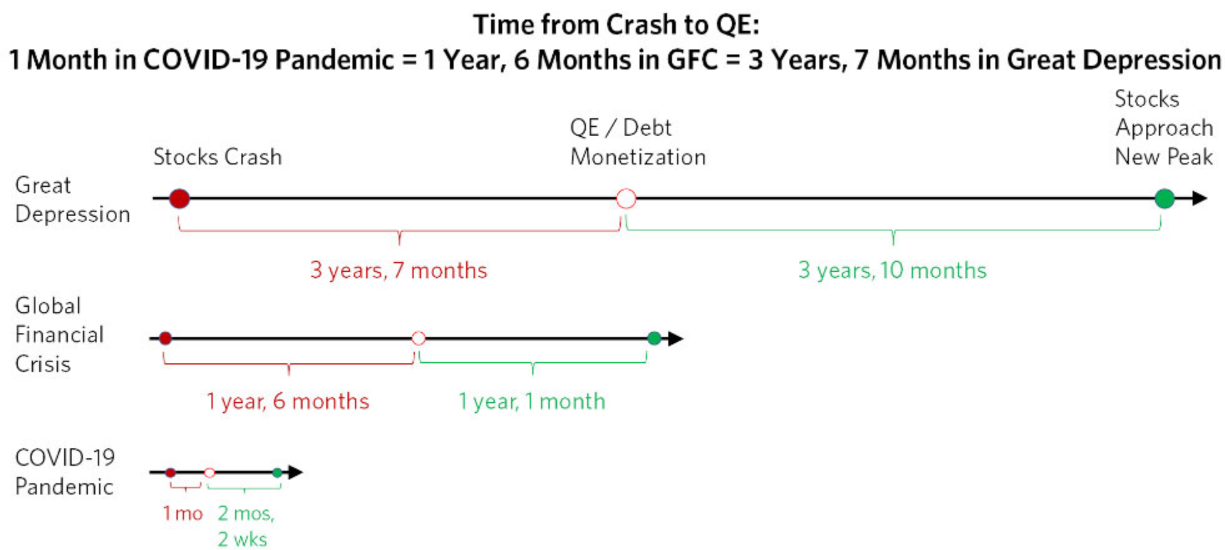


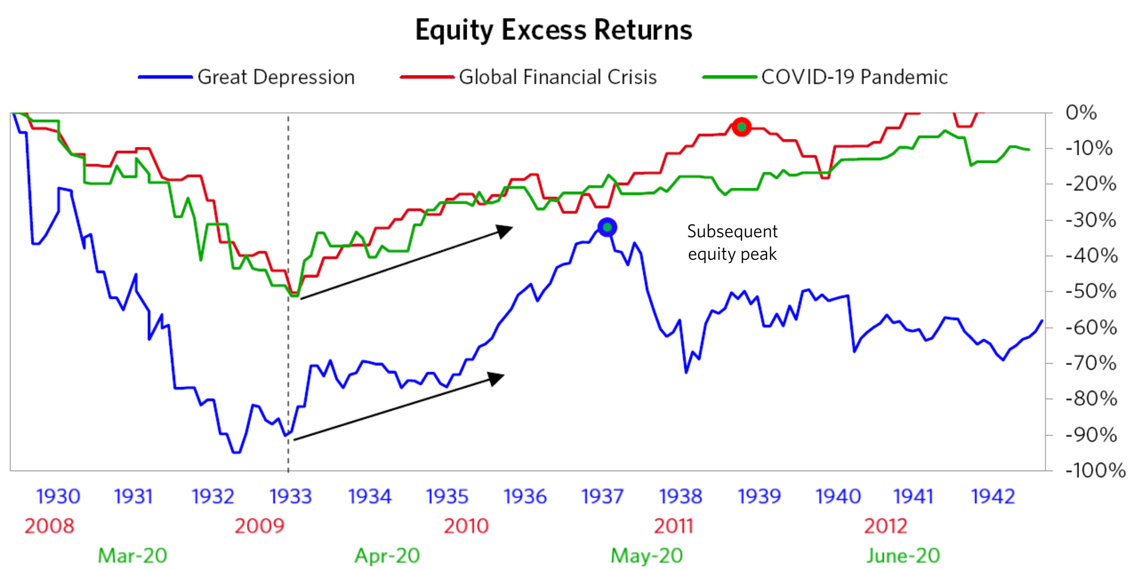




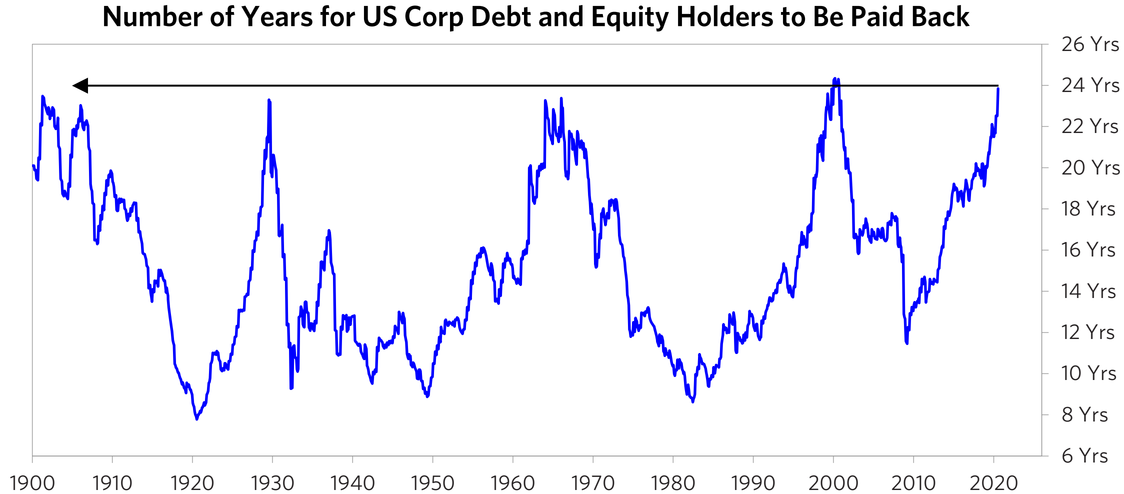


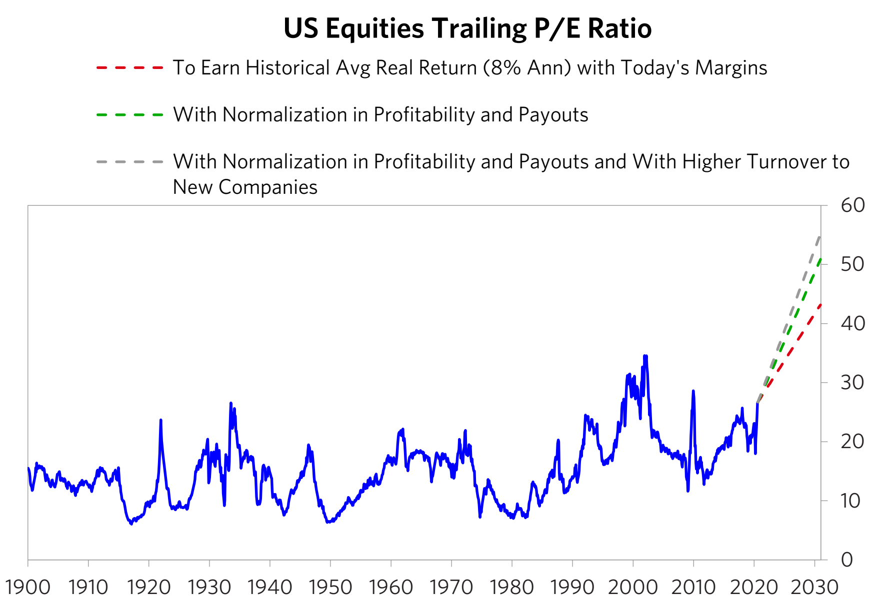
THE DRAWDOWN AND POLICY RESPONSE HAVE HAPPENED AT RECORD PACE

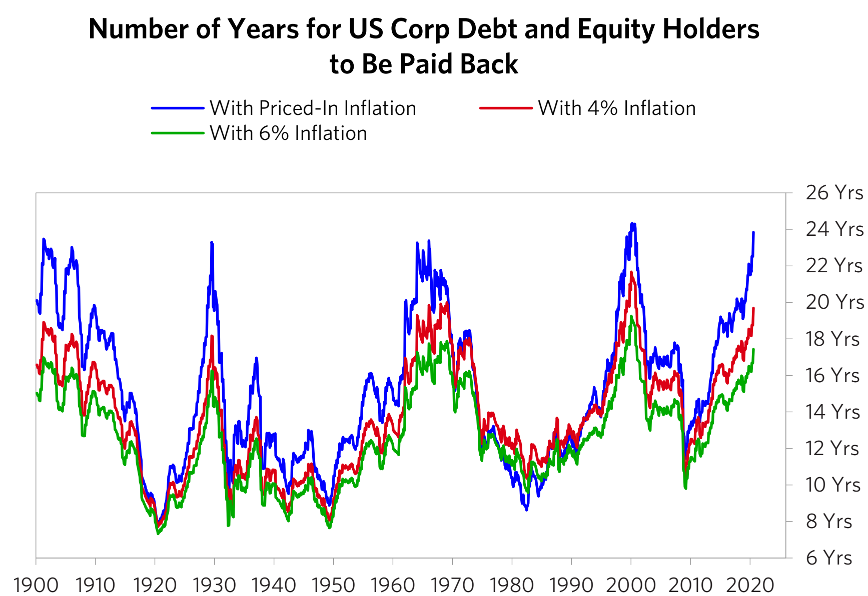




THREE POTENTIAL PATHS FOR EQUITIES: LOW RETURNS, P/E EXPANSION, OR HIGHER INFLATION & LOWER REAL RETURNS

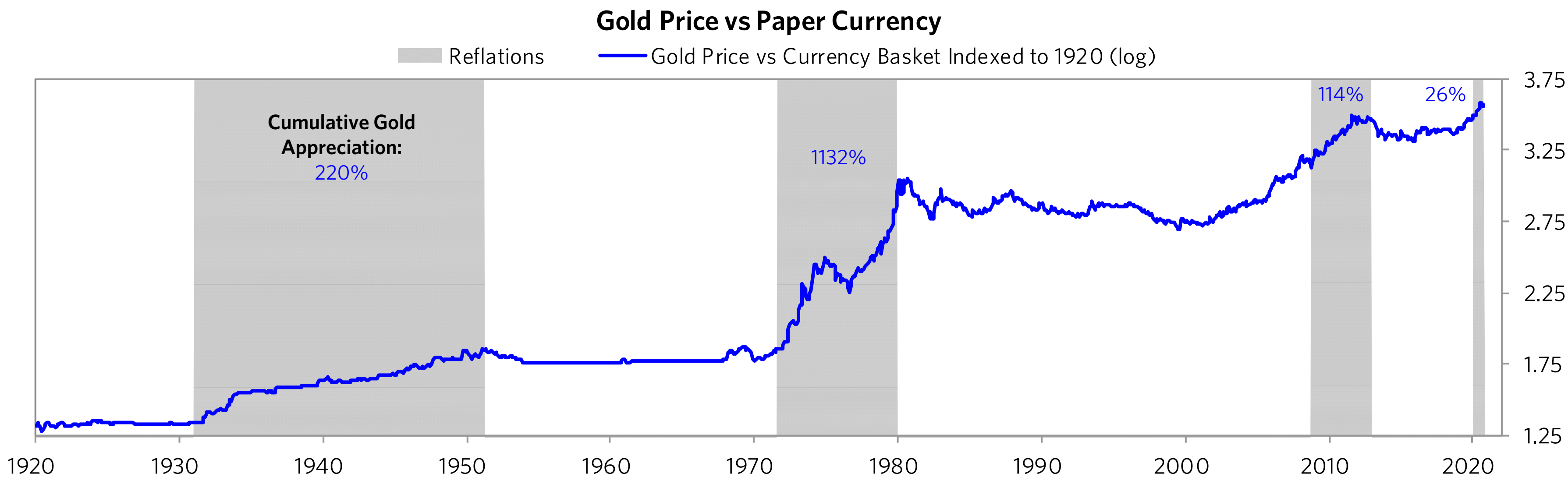


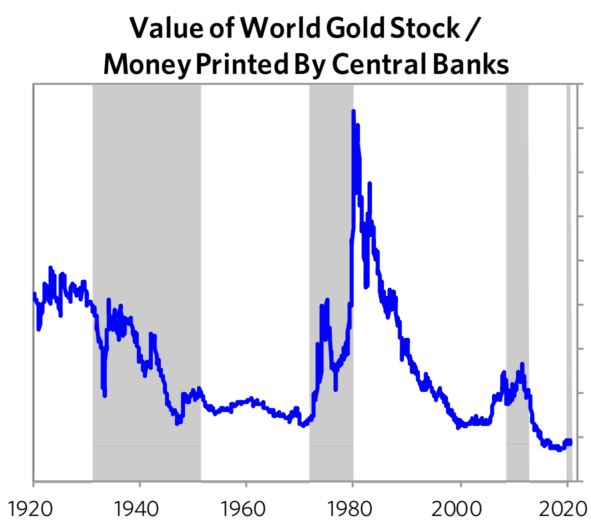


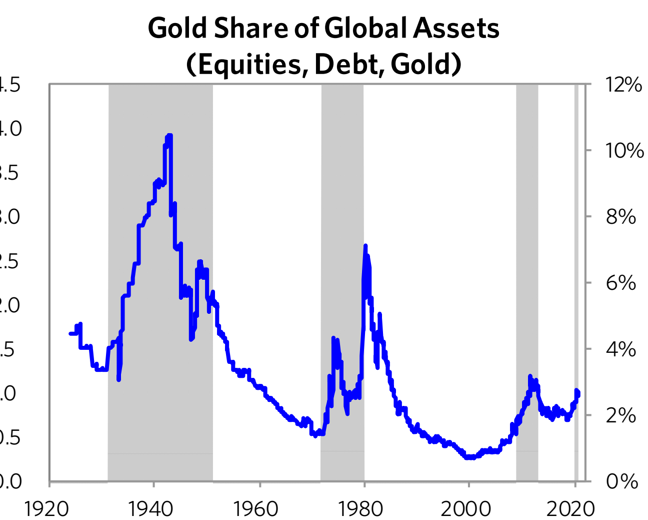


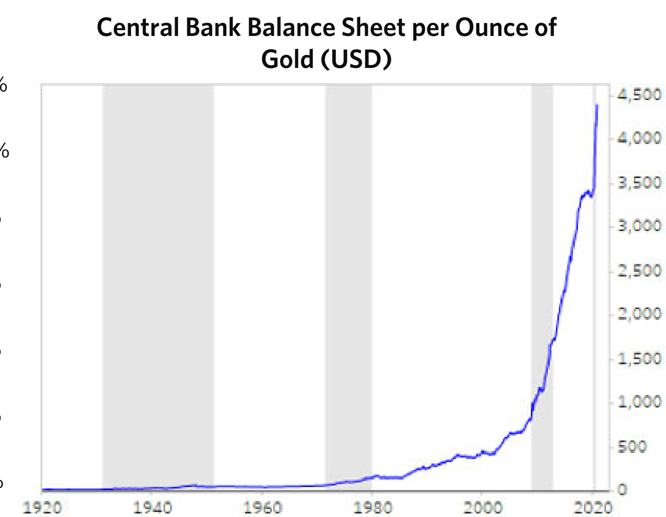
Please review the "Important Disclosures and Other Information" located at the end of this presentation.

MONETIZATION IS A LONG-TERM THREAT TO CURRENCIES AND GOLD HAS ROOM TO RUN



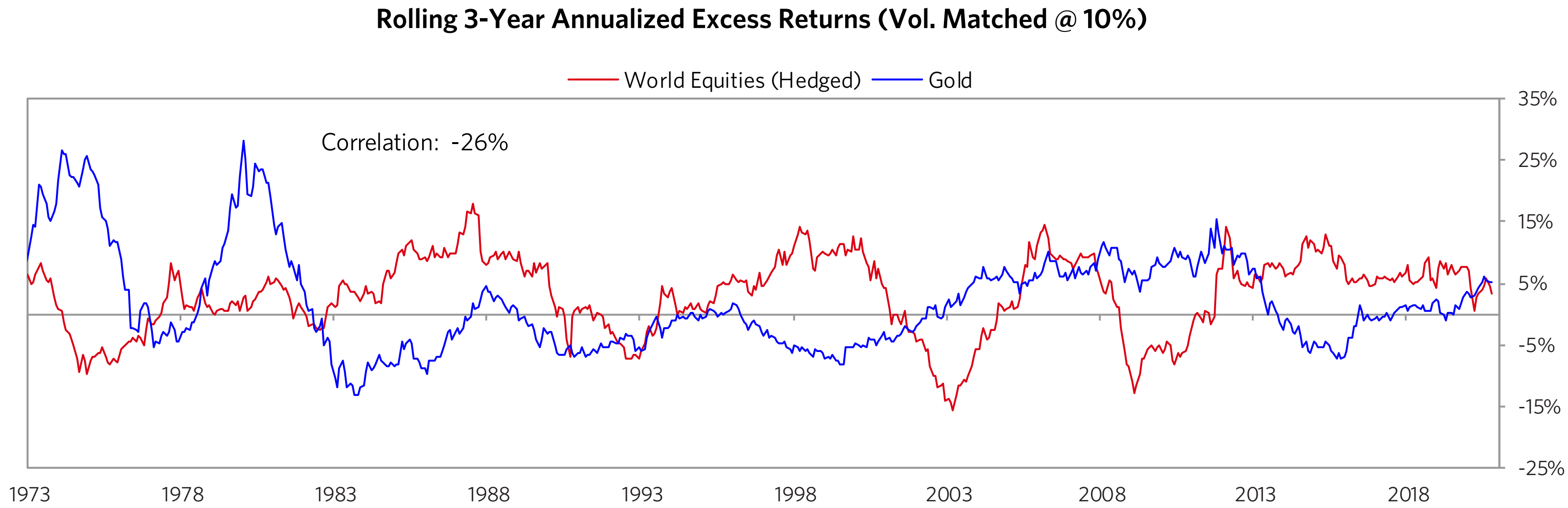


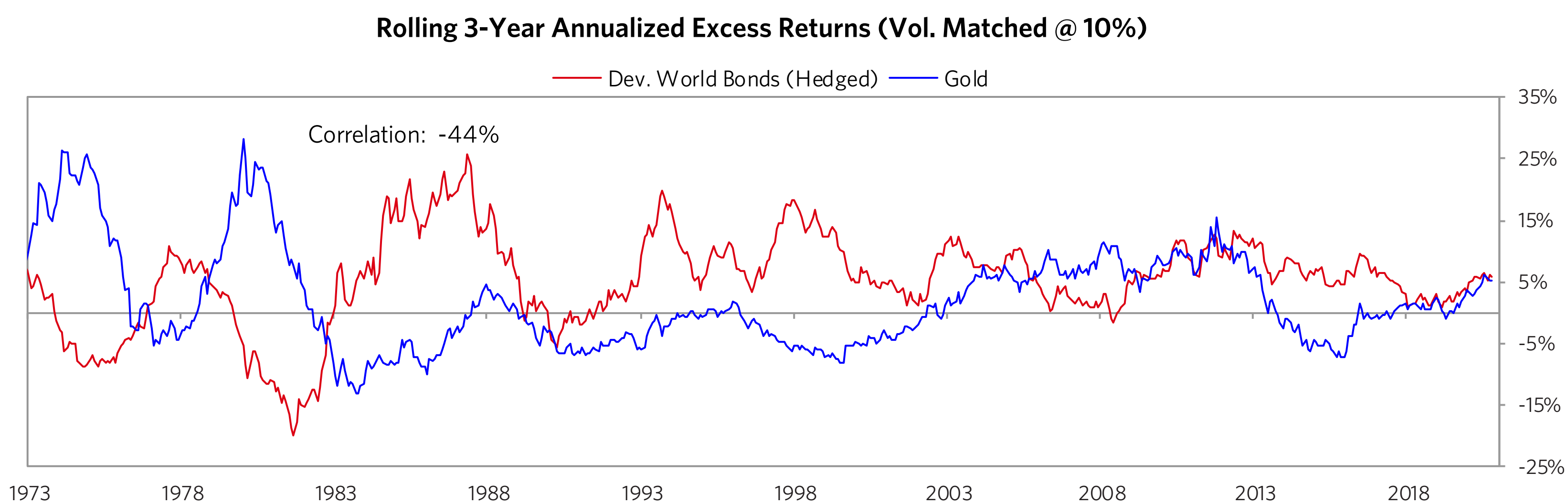




Updated October 2020. Please review the “Important Disclosures and Other Information” located at the end of this presentation.

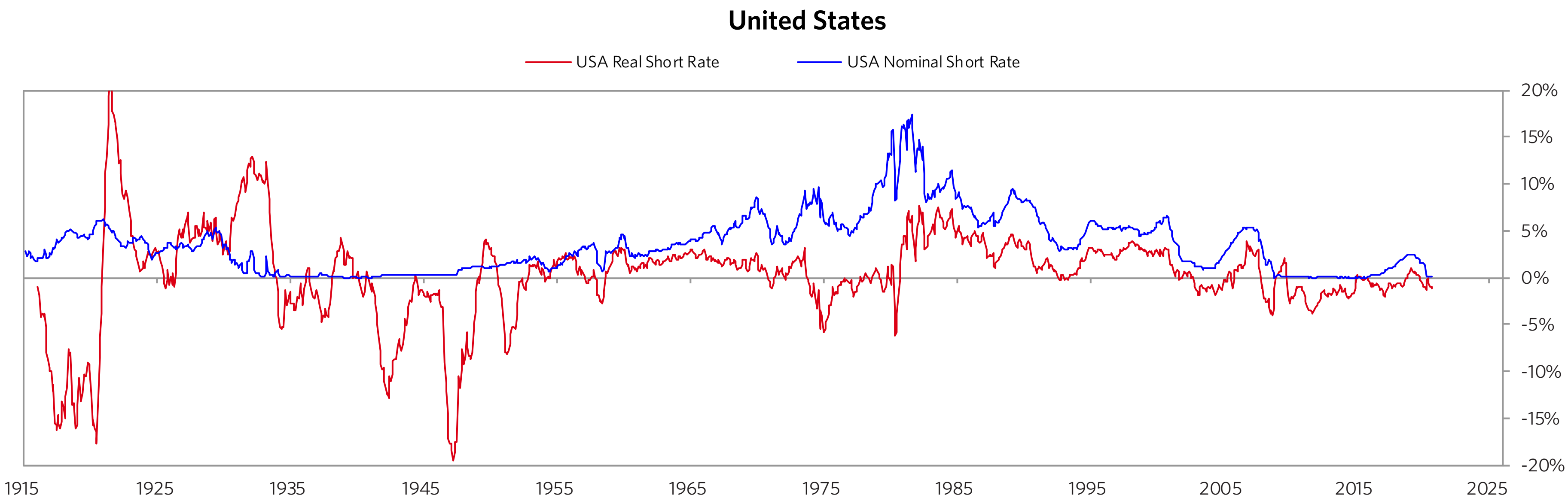
GOLD IS DIVERSIFYING

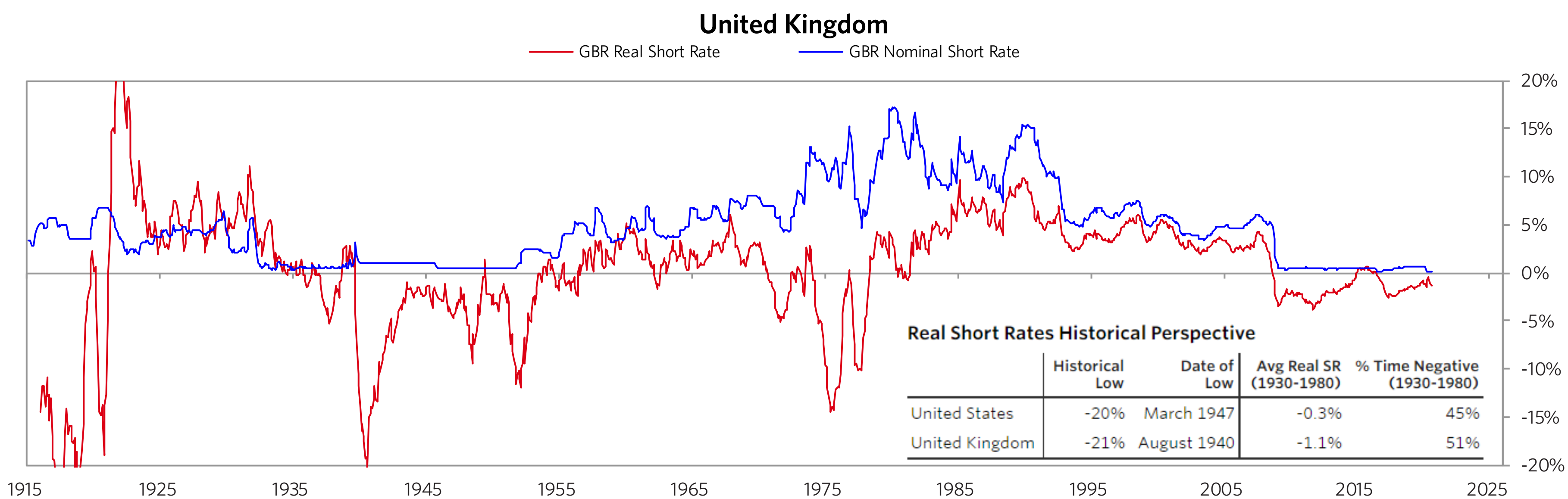




Data through October 31, 2020. Returns are shown excess of US cash. Vol. match based on assets' historical volatility. Please review the "Important Disclosures and Other Information" located at the end of this presentation.

REAL SHORT RATES DO NOT FACE A ZERO LOWER BOUND



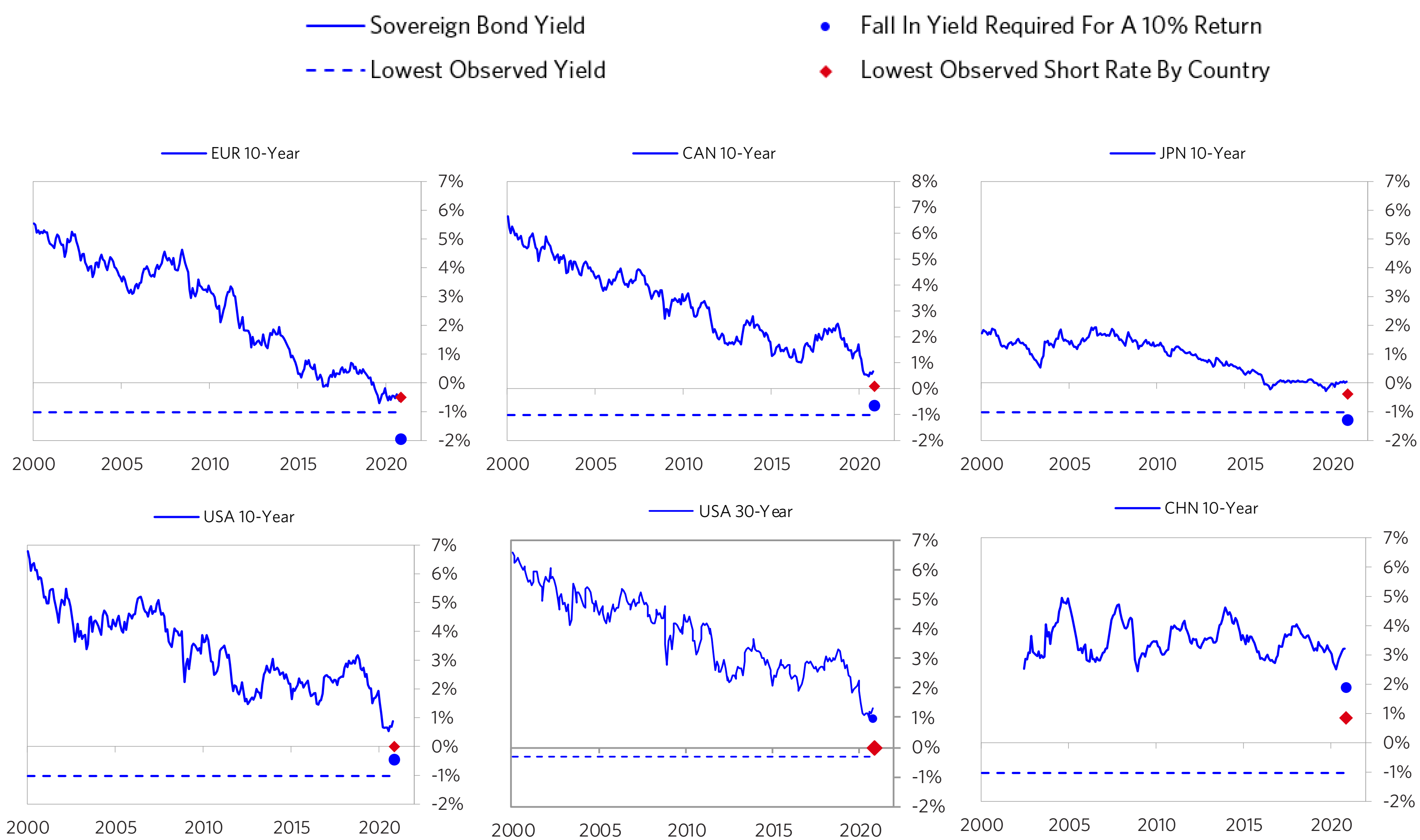


Real Short Rates Historical Perspective

	Historical Low	Date of Low	Avg Real SR (1930-1980)	% Time Negative (1930-1980)
United States	-20%	March 1947	-0.3%	45%
United Kingdom	-21%	August 1940	-1.1%	51%

Data through September 2020. Real rates calculated by subtracting year-over-year CPI inflation from nominal rates. Please review the “Important Disclosures and Other Information” located at the end of this presentation.

NOMINAL BONDS NO LONGER HAVE MEANINGFUL ROOM TO RALLY



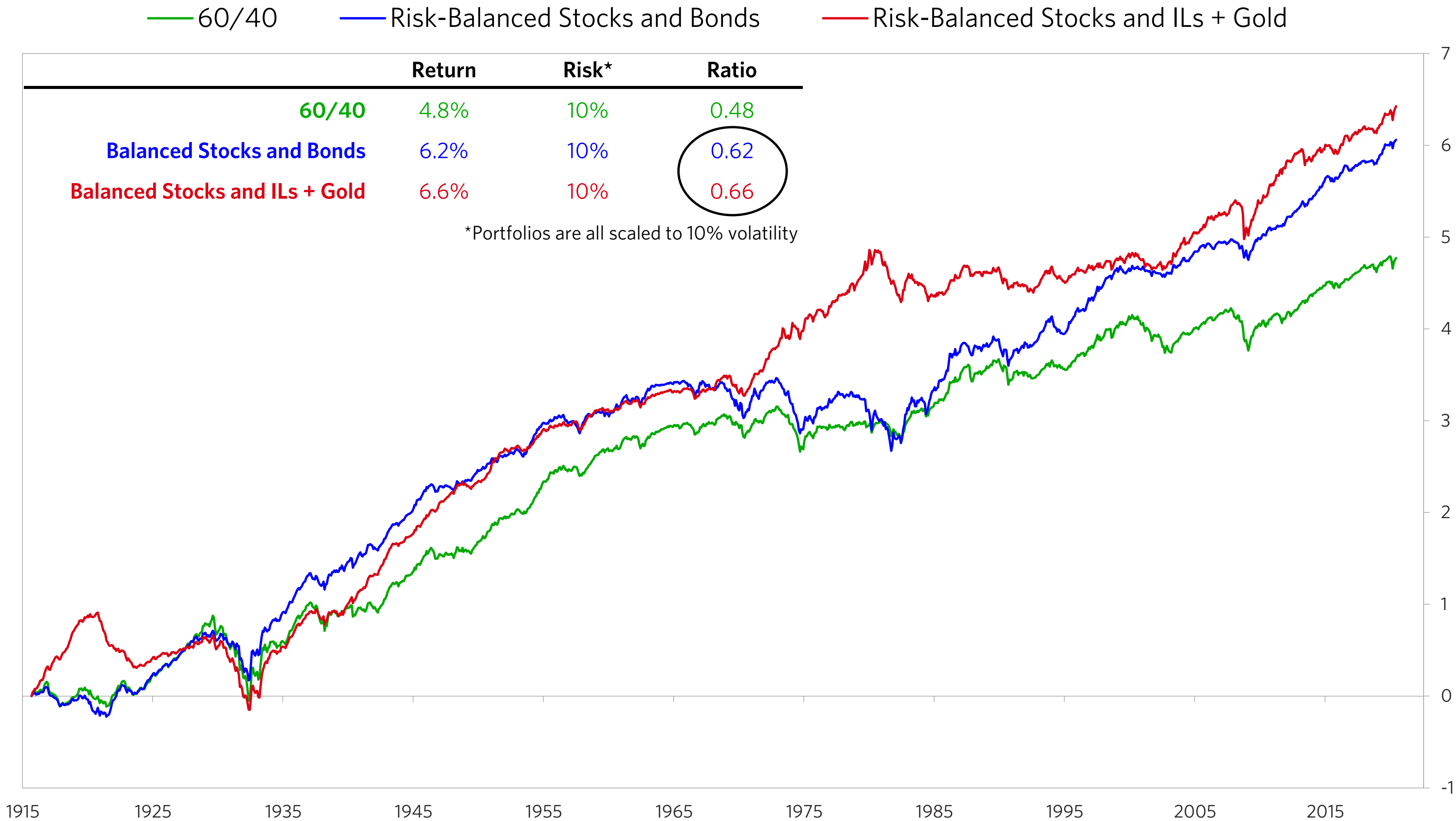
Many bonds are already unable to provide much protection…

… while others have some, but limited, room to rally.

Analysis ignores the impact of convexity. Data through 10/31/20. Please review the "Important Disclosures and Other Information" located at the end of this presentation.

OVER TIME, IL BONDS + GOLD PROVIDE A SIMILAR EFFICIENCY IMPROVEMENT AS NOMINAL BONDS

Global Portfolio Cumulative Excess Returns (ln)



	Return	Risk*	Ratio
60/40	4.8%	10%	0.48
Balanced Stocks and Bonds	6.2%	10%	0.62
Balanced Stocks and ILs + Gold	6.6%	10%	0.66

*Portfolios are all scaled to 10% volatility

The global 60/40 consists of a 60% capital allocation to equities and a 40% capital allocation to nominal bonds. Risk-balanced stocks and bonds and risk-balanced stocks and IL-bonds + gold consist of, respectively, equal risk allocations to stocks and nominal bonds and to stocks and a mix of IL bonds and gold. Past performance is not indicative of future results. Please review the “Important Disclosures and Other Information” located at the end of this presentation.

PENCILING OUT THE NEXT 3 YEARS FOR IL BONDS & NOMINALS

- If inflation exceeds the current breakeven inflation of 1.5%, IL bonds will outperform nominal bonds.
- Nominal bonds have limited upside with yields near zero. IL bonds have much greater upside should inflation rise, especially if policy makers choose to pin nominal yields at current levels to support growth.

Annual Return of 10yr Bonds over Next 3 Years

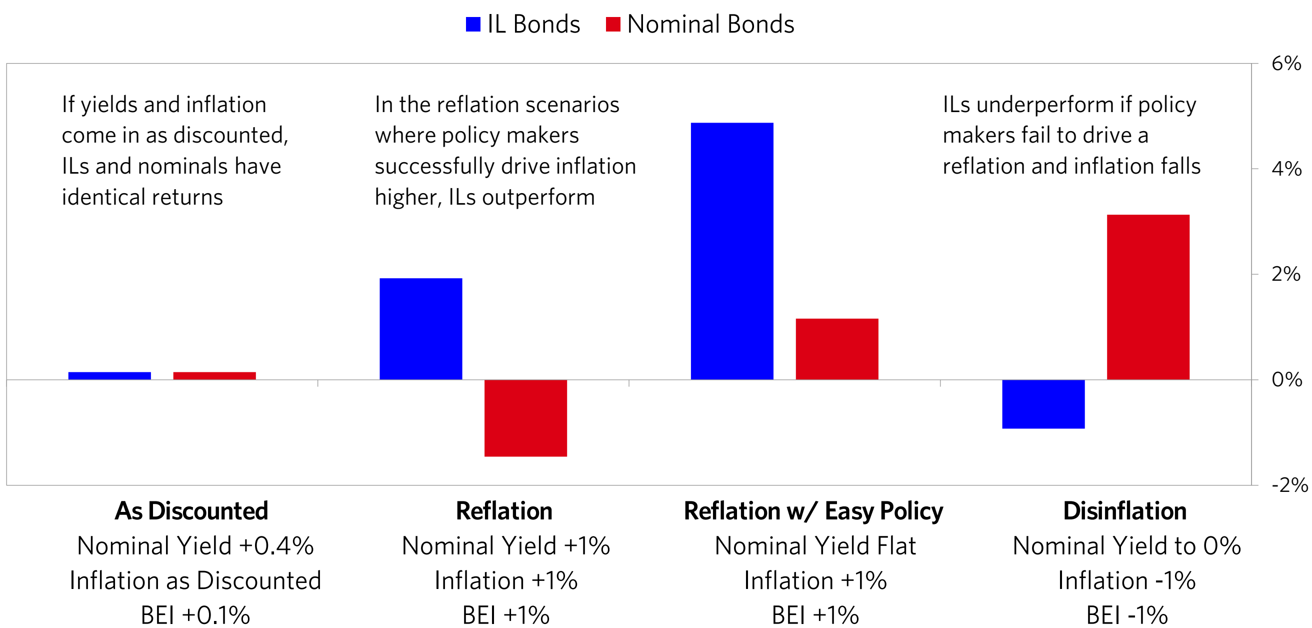
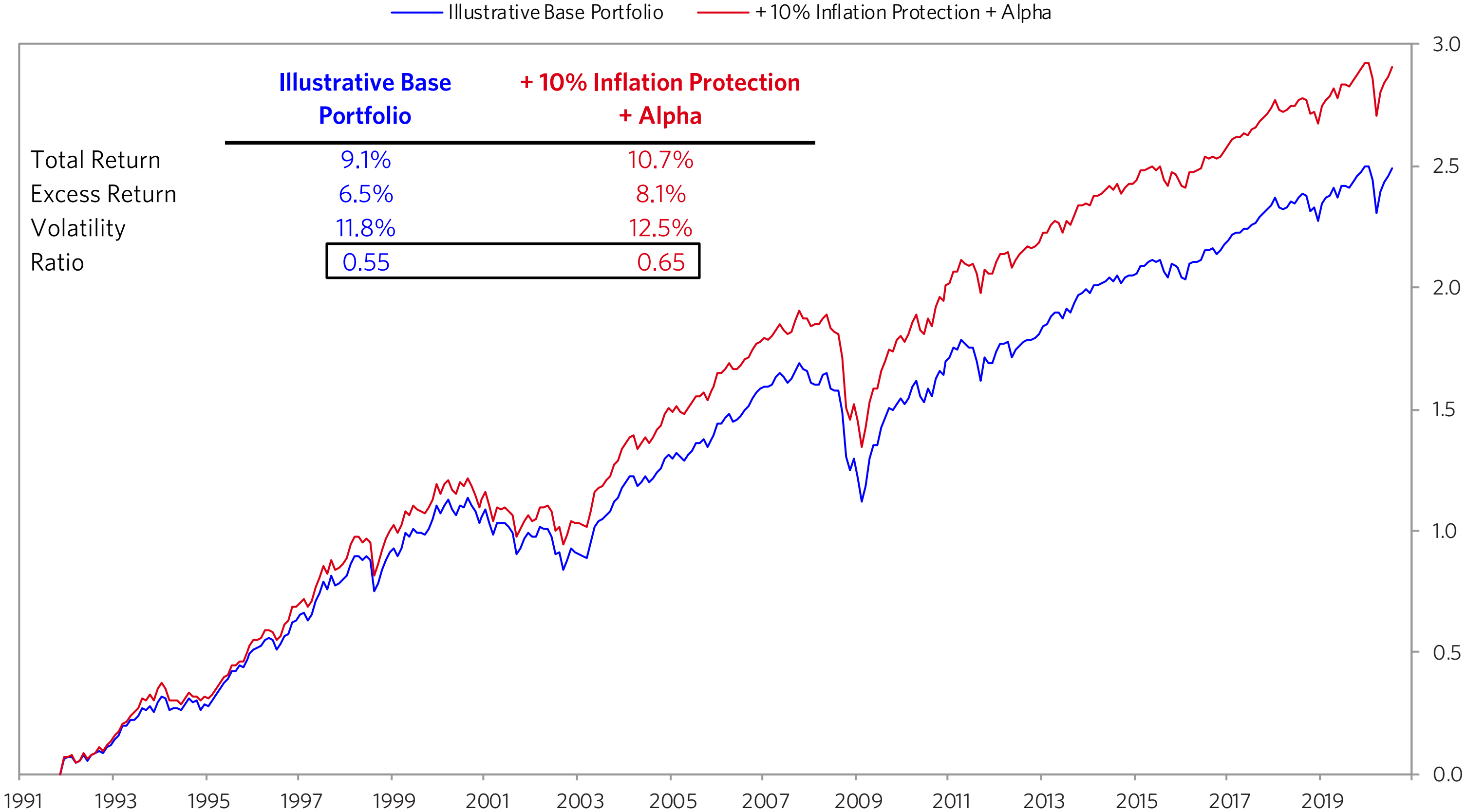


Chart as of August 2020. There is no guarantee that expected returns can or will be achieved. Please review the “Important Disclosures and Other Information” located at the end of this document.

HISTORICALLY, ADDING INFLATION PROTECTION + ALPHA FURTHER INCREASED RETURNS FOR LITTLE ADDITIONAL RISK

Cumulative Total Return (ln, Sim., Net)

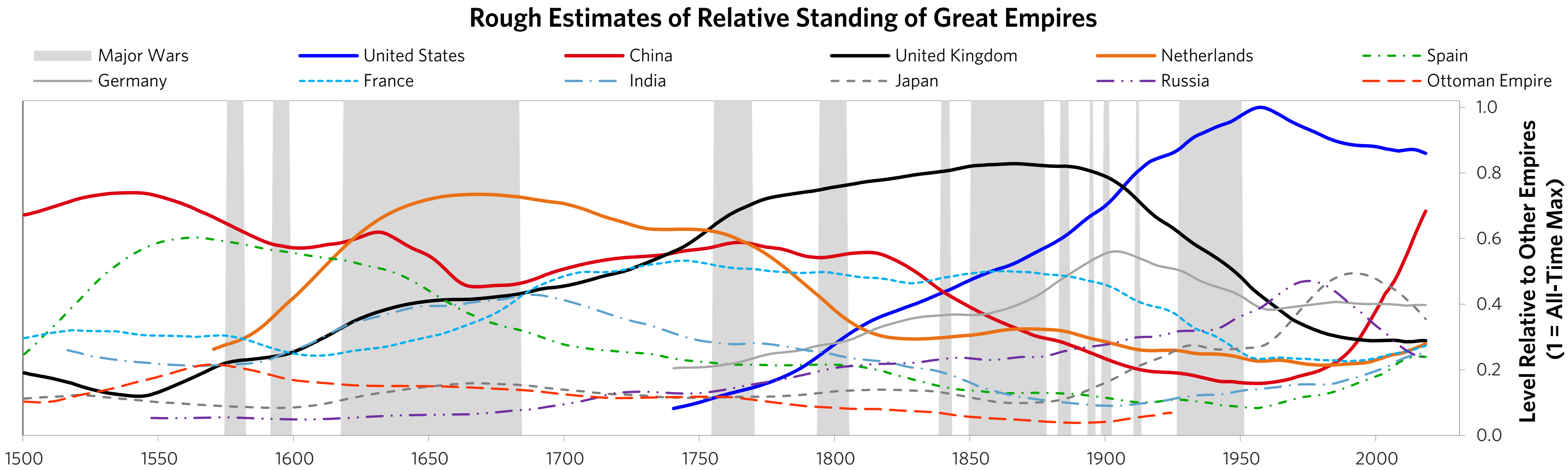
(Pure Alpha Returns Based on Related Fund Performance* Prior to May 2005)

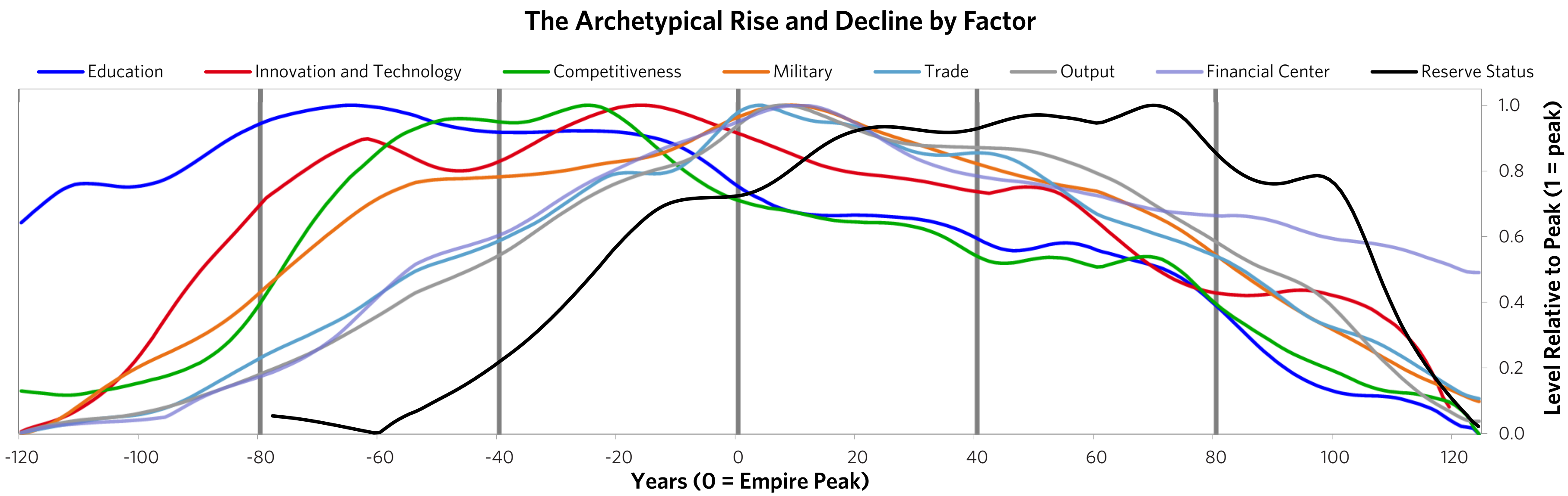


	Illustrative Base Portfolio	+ 10% Inflation Protection + Alpha
Total Return	9.1%	10.7%
Excess Return	6.5%	8.1%
Volatility	11.8%	12.5%
Ratio	0.55	0.65

Data from December 1991 through July 2020. More detailed information for the “Illustrative Base Portfolio” is available in the disclosure page for “Illustrative Base Portfolio”. “+ 10% Inflation Protection + Alpha” is Illustrative Base Portfolio + 10% nominal exposure to Inflation Protection + Alpha; please see associated back of deck disclosures. *Pure Alpha related fund performance is based on the performance of the Pure Alpha Strategy at 12% volatility scaled to 18% volatility. HYPOTHETICAL PERFORMANCE RESULTS HAVE MANY INHERENT LIMITATIONS, SOME OF WHICH ARE DESCRIBED BELOW. NO REPRESENTATION IS BEING MADE THAT ANY ACCOUNT WILL OR IS LIKELY TO ACHIEVE PROFITS OR LOSSES SIMILAR TO THOSE SHOWN. IN FACT, THERE ARE FREQUENTLY SHARP DIFFERENCES BETWEEN HYPOTHETICAL PERFORMANCE RESULTS AND THE ACTUAL RESULTS SUBSEQUENTLY ACHIEVED BY ANY PARTICULAR TRADING PROGRAM. ONE OF THE LIMITATIONS OF HYPOTHETICAL PERFORMANCE RESULTS IS THAT THEY ARE GENERALLY PREPARED WITH THE BENEFIT OF HINDSIGHT. IN ADDITION, HYPOTHETICAL TRADING DOES NOT INVOLVE FINANCIAL RISK, AND NO HYPOTHETICAL TRADING RECORD CAN COMPLETELY ACCOUNT FOR THE IMPACT OF FINANCIAL RISK IN ACTUAL TRADING. FOR EXAMPLE, THE ABILITY TO WITHSTAND LOSSES OR TO ADHERE TO A PARTICULAR TRADING PROGRAM IN SPITE OF TRADING LOSSES ARE MATERIAL POINTS WHICH CAN ALSO ADVERSELY AFFECT ACTUAL TRADING RESULTS. THERE ARE NUMEROUS OTHER FACTORS RELATED TO THE MARKETS IN GENERAL OR TO THE IMPLEMENTATION OF ANY SPECIFIC TRADING PROGRAM WHICH CANNOT BE FULLY ACCOUNTED FOR IN THE PREPARATION OF HYPOTHETICAL PERFORMANCE RESULTS AND ALL OF WHICH CAN ADVERSELY AFFECT ACTUAL TRADING RESULTS. Past performance is not indicative of future results. Please review the “Important Disclosures and Other Information” located at the end of this presentation.

THE DECLINE OF AN EMPIRE

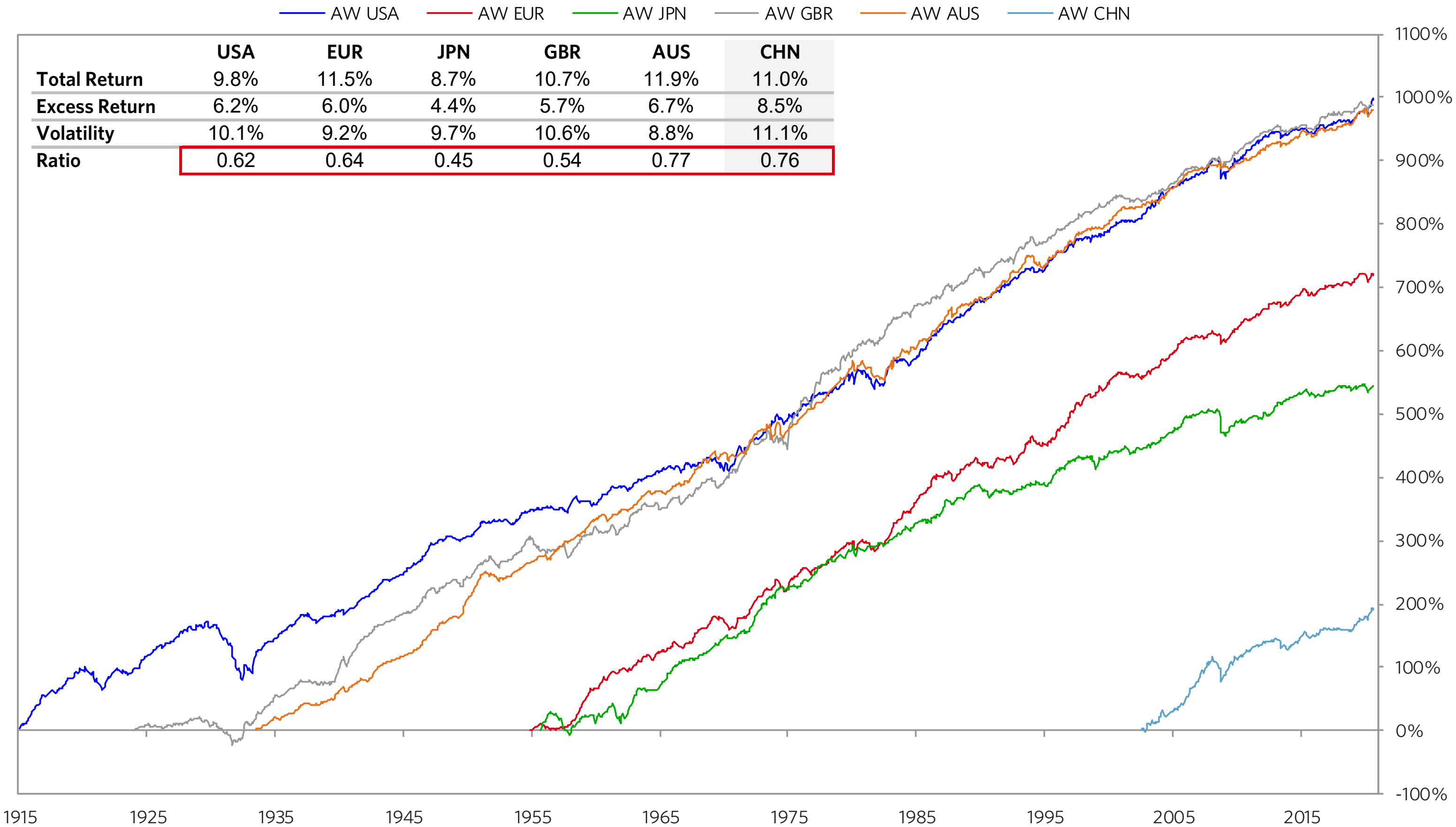




Please review the "Important Disclosures and Other Information" located at the end of this presentation.

ACROSS COUNTRIES, BALANCE CREATES CONSISTENCY

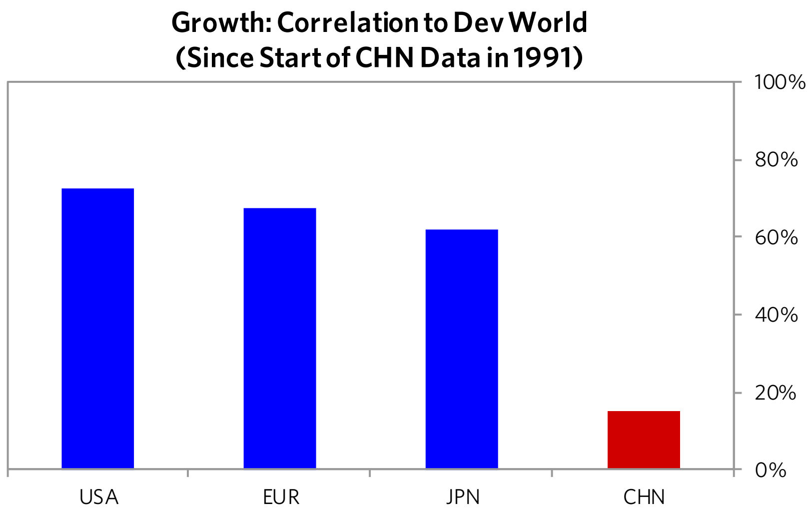
Simulated Cumulative Total Return (ln, gross of fees, local FX terms)

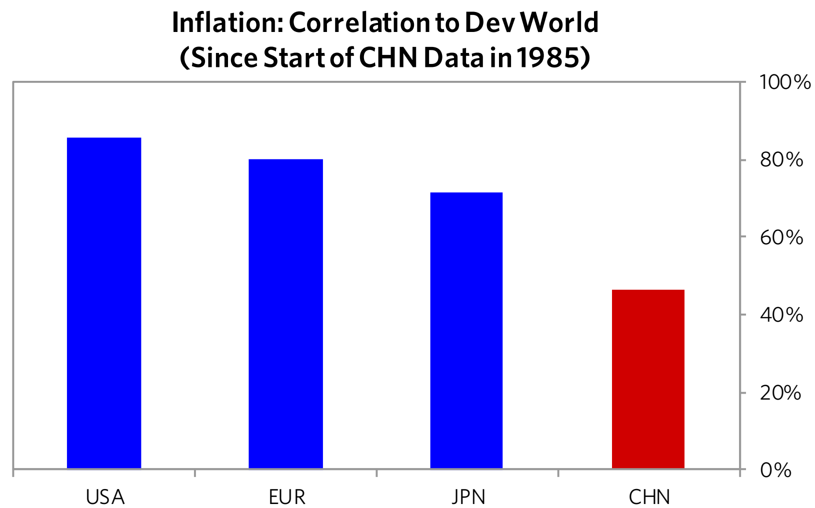


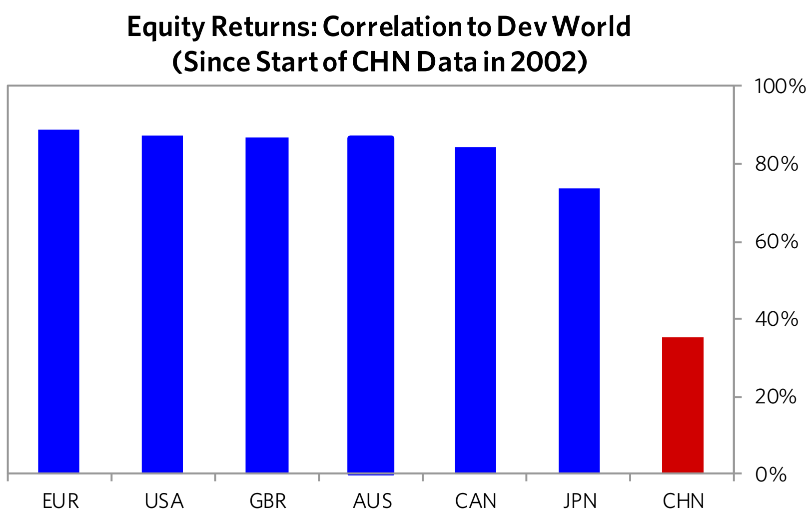
	USA	EUR	JPN	GBR	AUS	CHN
Total Return	9.8%	11.5%	8.7%	10.7%	11.9%	11.0%
Excess Return	6.2%	6.0%	4.4%	5.7%	6.7%	8.5%
Volatility	10.1%	9.2%	9.7%	10.6%	8.8%	11.1%
Ratio	0.62	0.64	0.45	0.54	0.77	0.76

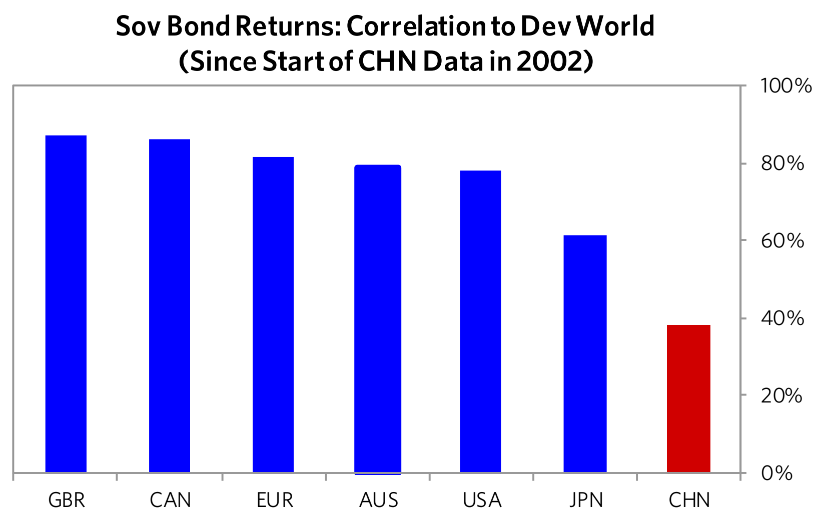
Data through September 2020. Single country All Weather simulates an All Weather-like asset allocation in regional terms using local assets (please see "All Weather Asset Mix Disclosure"). All Weather China also uses global assets where necessary to achieve diversification (please see "All Weather China Asset Mix Disclosure"). It is expected that the simulated performance will periodically change as a function of both refinements to our simulation methodology and the underlying market data. HYPOTHETICAL PERFORMANCE RESULTS HAVE MANY INHERENT LIMITATIONS, SOME OF WHICH ARE DESCRIBED BELOW. NO REPRESENTATION IS BEING MADE THAT ANY ACCOUNT WILL OR IS LIKELY TO ACHIEVE PROFITS OR LOSSES SIMILAR TO THOSE SHOWN. IN FACT, THERE ARE FREQUENTLY SHARP DIFFERENCES BETWEEN HYPOTHETICAL PERFORMANCE RESULTS AND THE ACTUAL RESULTS SUBSEQUENTLY ACHIEVED BY ANY PARTICULAR TRADING PROGRAM. ONE OF THE LIMITATIONS OF HYPOTHETICAL PERFORMANCE RESULTS IS THAT THEY ARE GENERALLY PREPARED WITH THE BENEFIT OF HINDSIGHT. IN ADDITION, HYPOTHETICAL TRADING DOES NOT INVOLVE FINANCIAL RISK, AND NO HYPOTHETICAL TRADING RECORD CAN COMPLETELY ACCOUNT FOR THE IMPACT OF FINANCIAL RISK IN ACTUAL TRADING. FOR EXAMPLE, THE ABILITY TO WITHSTAND LOSSES OR TO ADHERE TO A PARTICULAR TRADING PROGRAM IN SPITE OF TRADING LOSSES ARE MATERIAL POINTS WHICH CAN ALSO ADVERSELY AFFECT ACTUAL TRADING RESULTS. THERE ARE NUMEROUS OTHER FACTORS RELATED TO THE MARKETS IN GENERAL OR TO THE IMPLEMENTATION OF ANY SPECIFIC TRADING PROGRAM WHICH CANNOT BE FULLY ACCOUNTED FOR IN THE PREPARATION OF HYPOTHETICAL PERFORMANCE RESULTS AND ALL OF WHICH CAN ADVERSELY AFFECT ACTUAL TRADING RESULTS. Past performance is not indicative of future results. Please review the "Important Disclosures and Other Information" located at the end of this presentation.

CHINESE CONDITIONS AND MARKETS ARE LOWLY RELATED TO THE REST OF THE WORLD



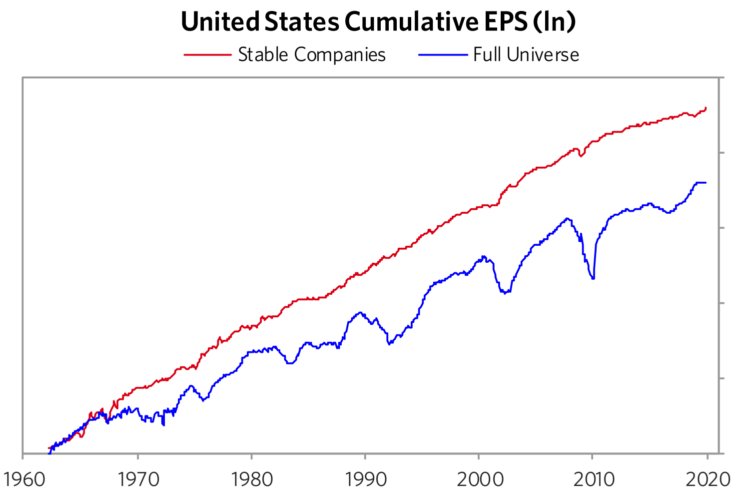


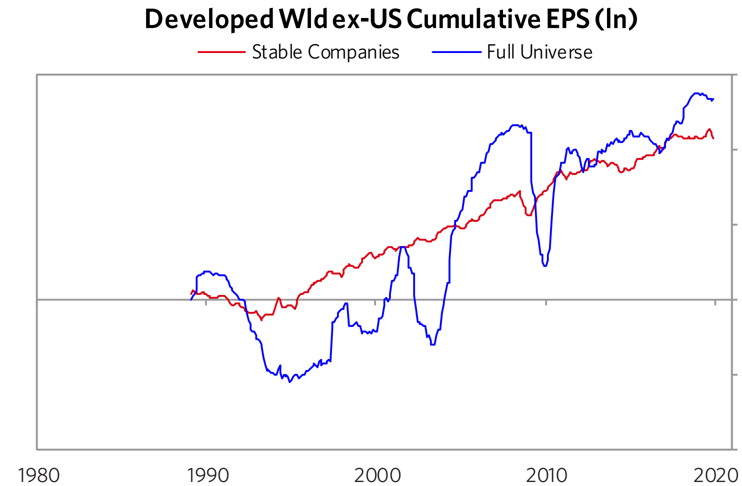


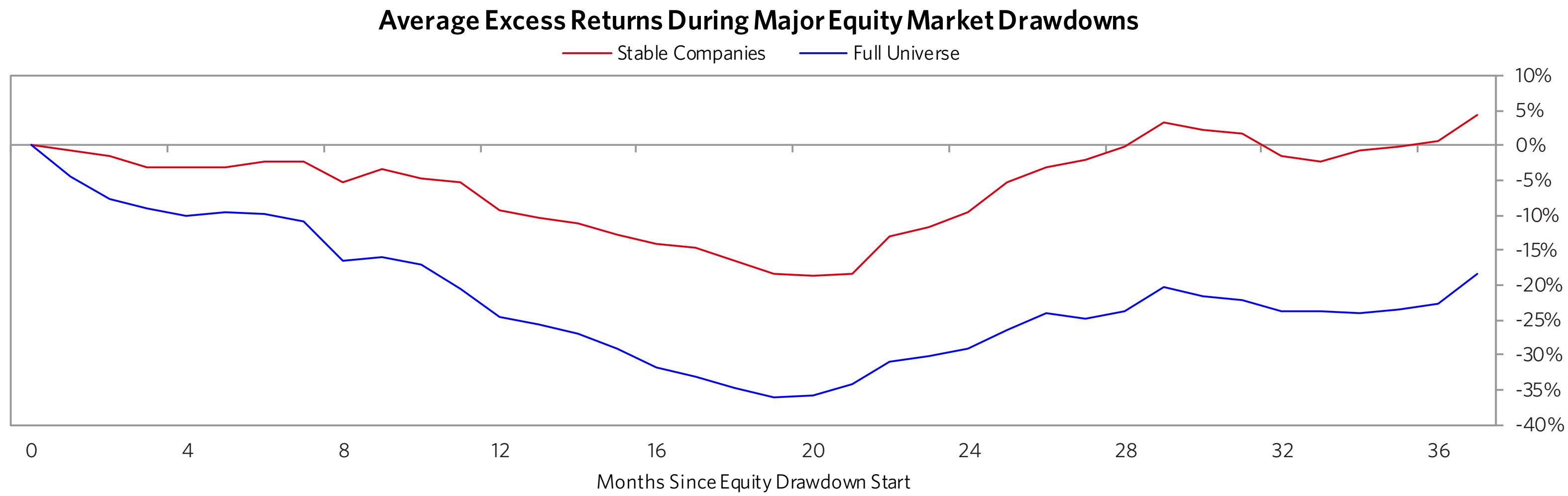


Updated as of data available through September 2020. “Correlation to Dev World” refers to the correlation of growth, inflation or returns in that country to the developed world, excluding the referenced country when that country is part of the developed world. Correlation is based on long-term averages and at any given point in time could be higher or lower than in the periods shown above. Please review the “Important Disclosures and Other Information” located at the end of this presentation.

STABLE CASH FLOW EQUITIES: MORE STABLE EARNINGS TYPICALLY LEAD TO BETTER PERFORMANCE IN DOWN MARKETS



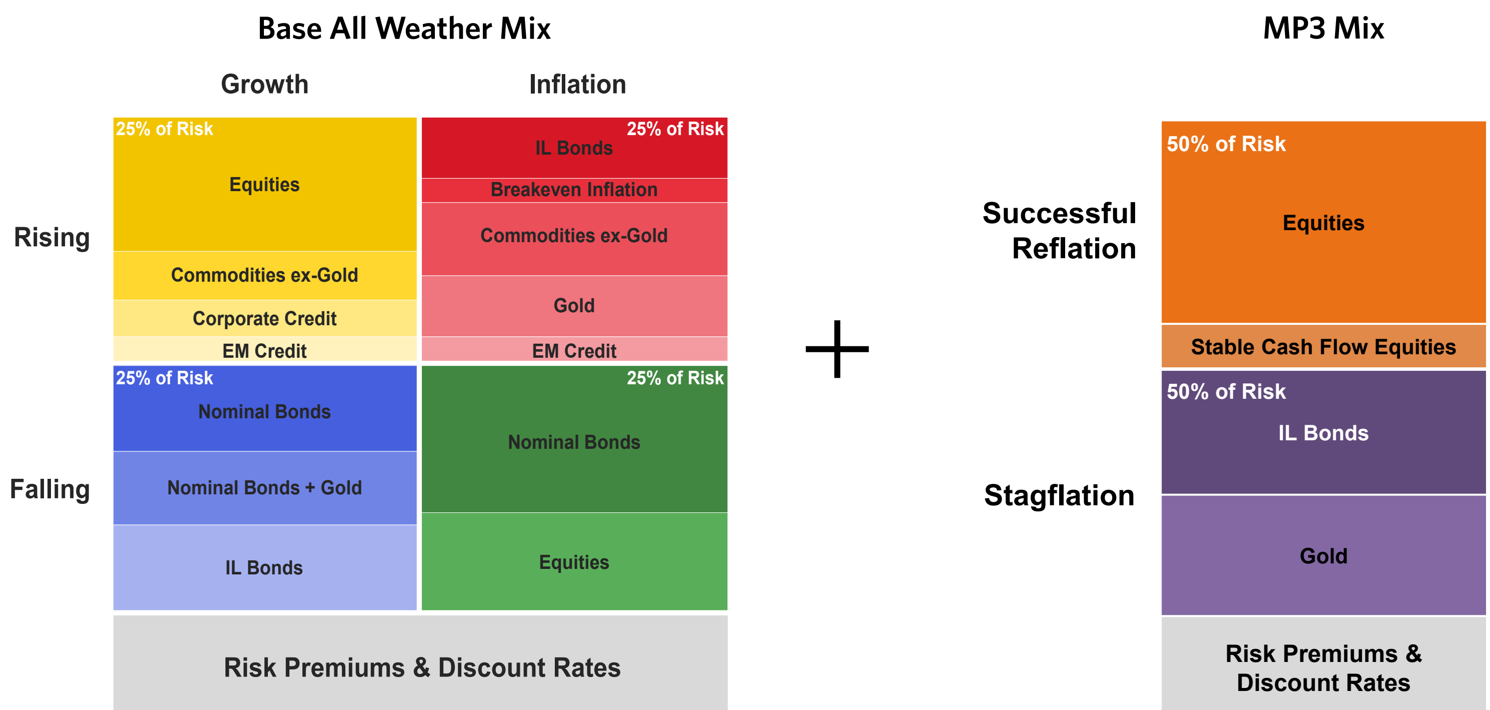




These perspectives are a product of current and ongoing Bridgewater research that is subject to change without notice and are shown for illustrative purposes only. The "stable companies" shown here represent a dynamic equity allocation created with Bridgewater's proprietary process for selecting companies at each point in time that are expected to have the most stable underlying earnings. HYPOTHETICAL PERFORMANCE RESULTS HAVE MANY INHERENT LIMITATIONS, SOME OF WHICH ARE DESCRIBED BELOW. NO REPRESENTATION IS BEING MADE THAT ANY ACCOUNT WILL OR IS LIKELY TO ACHIEVE PROFITS OR LOSSES SIMILAR TO THOSE SHOWN. IN FACT, THERE ARE FREQUENTLY SHARP DIFFERENCES BETWEEN HYPOTHETICAL PERFORMANCE RESULTS AND THE ACTUAL RESULTS SUBSEQUENTLY ACHIEVED BY ANY PARTICULAR TRADING PROGRAM. ONE OF THE LIMITATIONS OF HYPOTHETICAL PERFORMANCE RESULTS IS THAT THEY ARE GENERALLY PREPARED WITH THE BENEFIT OF HINDSIGHT. IN ADDITION, HYPOTHETICAL TRADING DOES NOT INVOLVE FINANCIAL RISK, AND NO HYPOTHETICAL TRADING RECORD CAN COMPLETELY ACCOUNT FOR THE IMPACT OF FINANCIAL RISK IN ACTUAL TRADING. FOR EXAMPLE, THE ABILITY TO WITHSTAND LOSSES OR TO ADHERE TO A PARTICULAR TRADING PROGRAM IN SPITE OF TRADING LOSSES ARE MATERIAL POINTS WHICH CAN ALSO ADVERSELY AFFECT ACTUAL TRADING RESULTS. THERE ARE NUMEROUS OTHER FACTORS RELATED TO THE MARKETS IN GENERAL OR TO THE IMPLEMENTATION OF ANY SPECIFIC TRADING PROGRAM WHICH CANNOT BE FULLY ACCOUNTED FOR IN THE PREPARATION OF HYPOTHETICAL PERFORMANCE RESULTS AND ALL OF WHICH CAN ADVERSELY AFFECT ACTUAL TRADING RESULTS. Past performance is not indicative of future results. Please review the "Important Disclosures and Other Information" located at the end of this presentation.

ALL WEATHER PORTFOLIO CONSTRUCTION IN AN MP3 WORLD

- We start by taking as much risk in the traditional All Weather mix as we can, reflecting our assessment of how much balance is attainable with those assets.
- We then systematically assess policy makers' ability to reflate with MP3 policies and add risk through an "MP3 mix" of equities, gold, and inflation-linked bonds that can provide good balance in this environment.
- The overall portfolio is the sum of these two components.
- We are also bolstering our geographic diversification (particularly with regards to China and the Asia-bloc).



For illustrative purposes only. Please review the "Important Disclosures and Other Information" located at the end of this presentation.

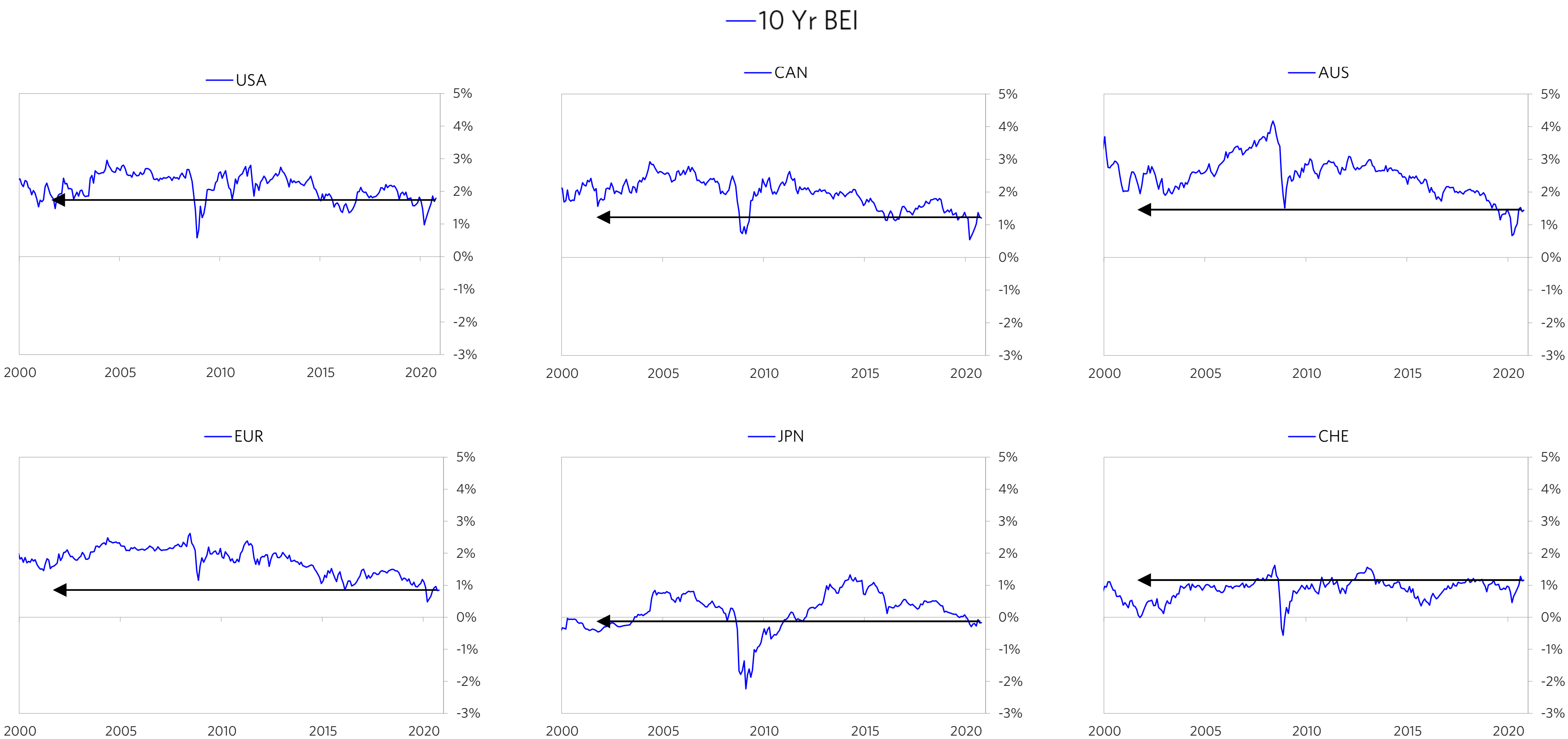
TODAY'S UNIQUE INVESTMENT CHALLENGES

Three sources of return:

Total Return	=	Cash (Don't Invest)	+	Beta (Hold Assets)	+	Alpha (Make Bets)
		– Likely to be ~0% for a while – Central banks are trying to diminish the value of cash		– Yields are at historic lows – Diversification has never been more important, but also never more difficult to achieve – Need to consider how to get balance in an MP3 world		– Alpha is difficult: requires unique insight – Unprecedented environment with different linkages presents both challenges and great opportunities – Potential to be uncorrelated

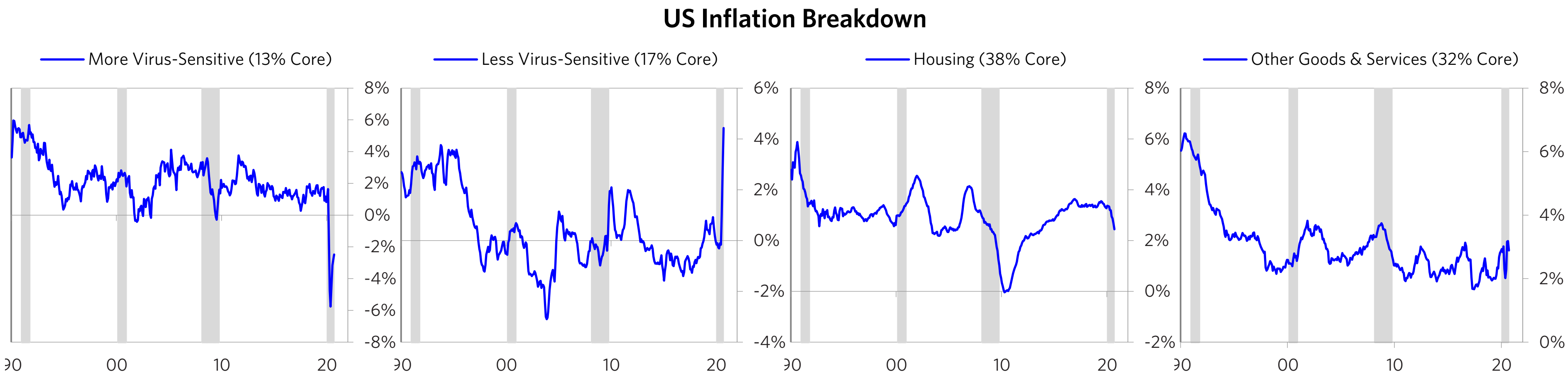
INFLATION IS DISCOUNTED TO BE LOW GLOBALLY

- It would not take much inflation to meaningfully exceed what is currently priced in.

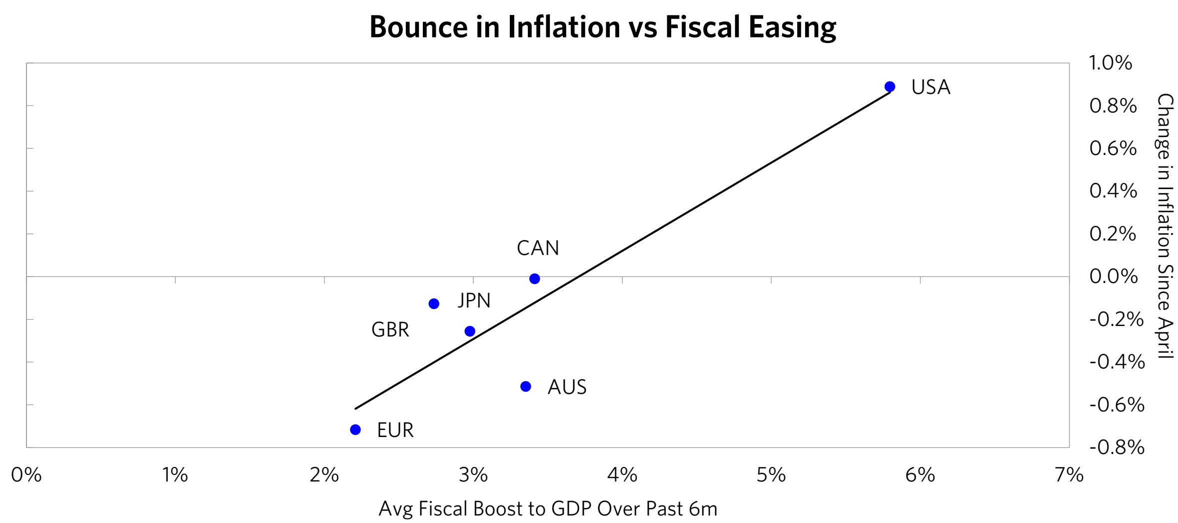


Data as of October 31, 2020. Please review the "Important Disclosures and Other Information" located at the end of this presentation.

HIGHER INFLATION IN LESS VIRUS-SENSITIVE SECTORS AND IN COUNTRIES THAT HAVE STIMULATED MORE

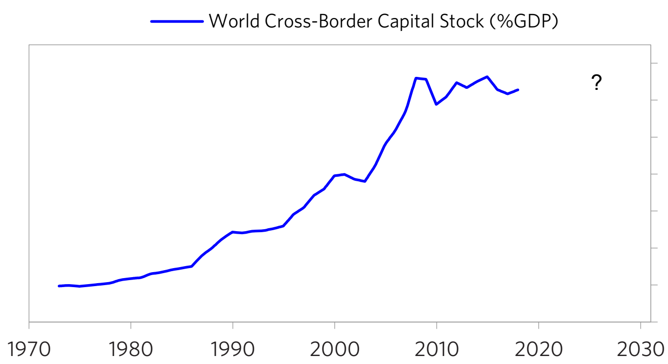


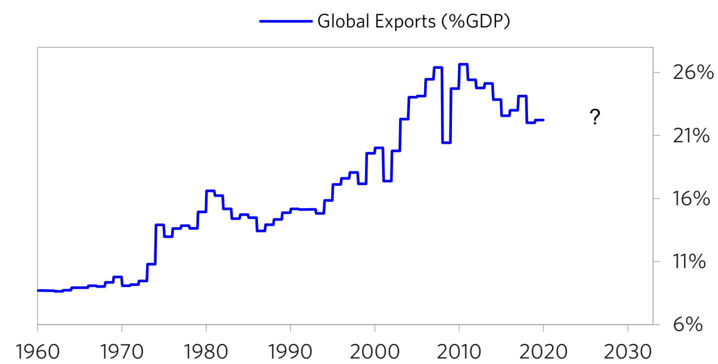
Note: recessions highlighted in gray

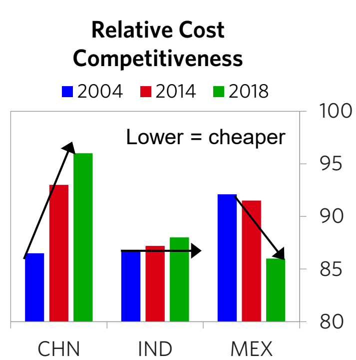


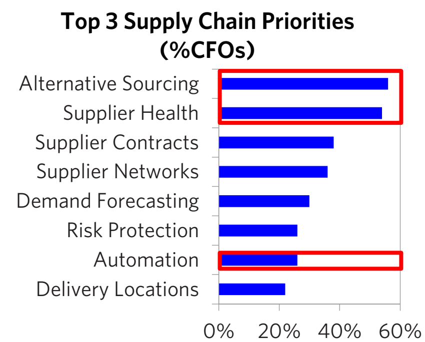
UNCERTAIN FUTURE FOR GLOBALIZATION

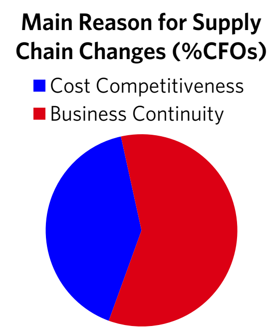
- The rise in globalization unlocked productivity from the emerging world – effectively increasing the quantity of goods that could be produced at a given price.
- As the labor arbitrage closed, this trend slowed. The pandemic, shifting attitudes to free trade, and rising geopolitical conflict are further headwinds.





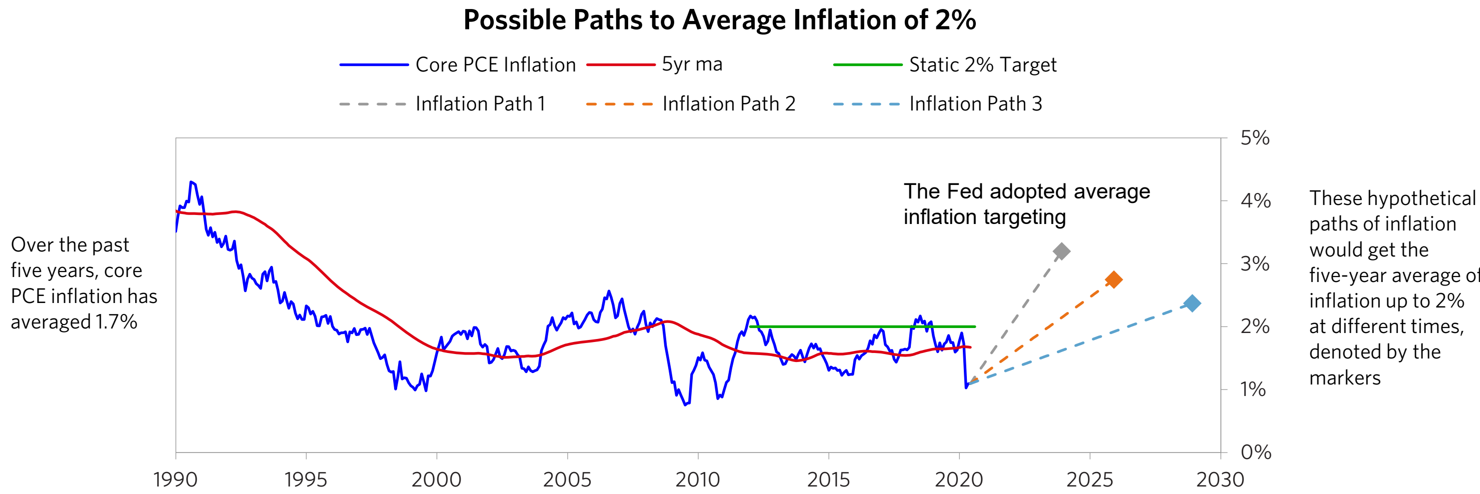






Data as of June 2020. Please review the "Important Disclosures and Other Information" located at the end of this presentation.

CENTRAL BANKS' SHIFTING ATTITUDES TOWARD INFLATION



"So, you know, we're—we're not thinking about raising rates. **We're not even thinking about thinking about raising rates.** So what we're thinking about is—is providing support for this economy. We do think this is going to take some time."

Jerome Powell, Fed Chair, June 2020

"…[I]n the current environment of lower inflation, the concerns we face are different and this needs to be reflected in our inflation aim. **Ensuring that there is sufficient space above zero** to re-empower conventional monetary policy becomes more important. And, to underpin inflation expectations, we need to ensure that our aim is perceived to be **symmetric** by the public."

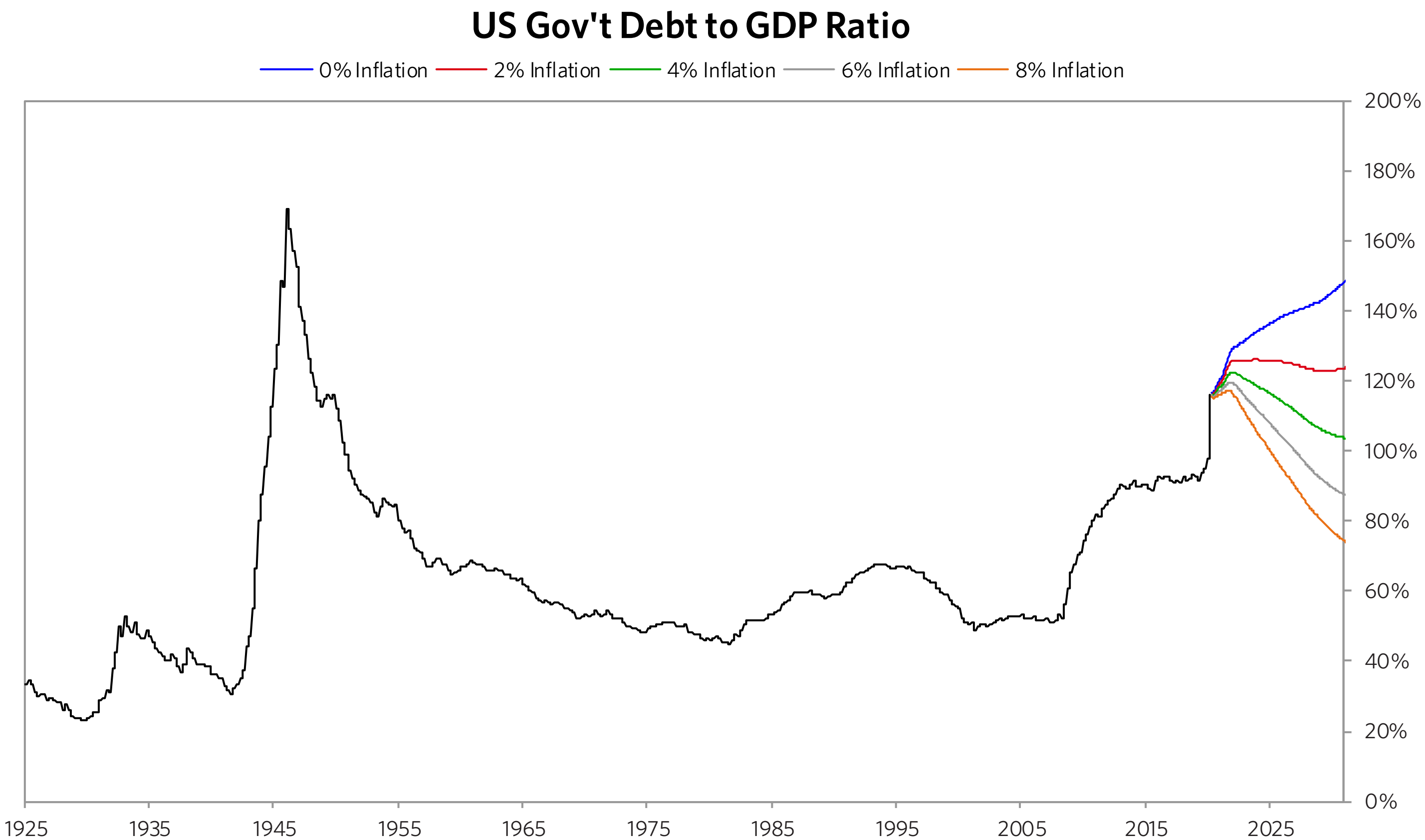
Christine Lagarde, ECB President, September 2020

Inflation paths shown in the chart are illustrative only and not reflective of Bridgewater's projections of inflation. Please review the "Important Disclosures and Other Information" located at the end of this presentation.

INFLATION MAY BE THE LEAST PAINFUL PATH TO REDUCING DEBT BURDENS

- Inflation can help alleviate debt burdens by raising the cash flows in the economy that can be used to pay off the debts.

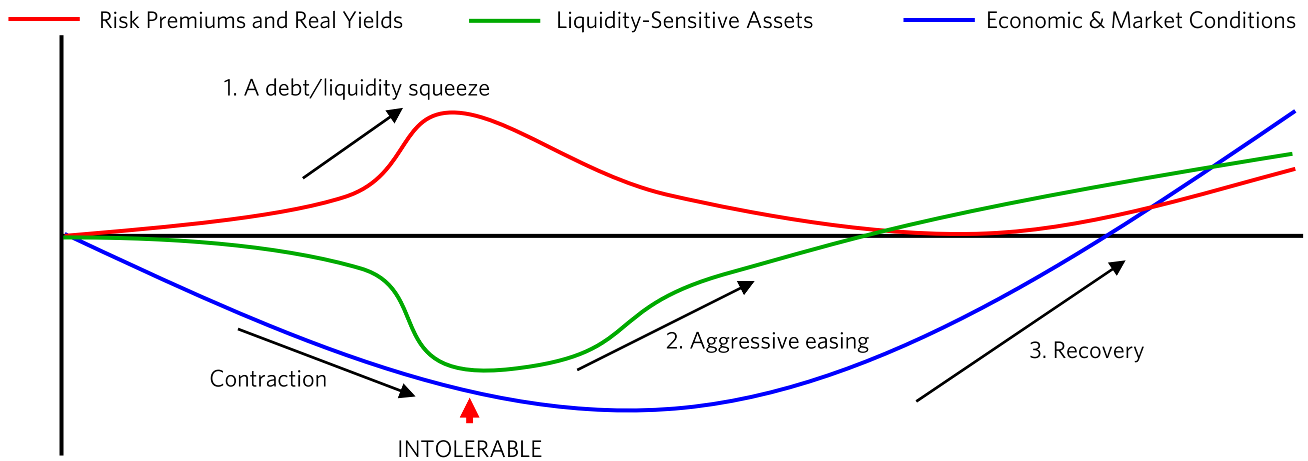
- Attempting to reduce debts by cutting government spending or raising taxes could exacerbate weak economic conditions.



Analysis uses Congressional Budget Office projections published in September 2020 and assumes that GDP, government non-interest spending, and government revenue scale with inflation. Please review the "Important Disclosures and Other Information" located at the end of this presentation.

POLICY MAKERS HAVE A TRACK RECORD OF GETTING WHAT THEY WANT

The Archetypical Reflationary Cycle Since 1800



Reflation Trades Across 127 Panics and Reflations Since 1800 (Simulated)

Summary Stats Across 39 Countries	**Real Return (ann)**	**Real Return Ratio (ann)**	**Drawdowns**
Avg of All USA/GBR Cases	10.5%	2.00	-5.2%
Median of All USA/GBR Cases	9.7%	1.80	-3.5%
Avg of USA/GBR Cases Since 1900	11.7%	1.55	-6.5%
Median of USA/GBR Cases Since 1900	13.2%	1.31	-5.6%
Median of All Countries	*13.2%*	*1.09*	*-8.2%*
Avg Through All Cases (Vol-Matched)	*11.8%*	*1.16*	-
Avg Through All Cases (ex-Hyperinflations)	*13.3%*	*0.77*	-

Winning trades in 114 out of 127 reflation cases (90% winning percentage)

Important Disclosures and Other Information

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Bridgewater believes that a particular return stream should be evaluated against its expected performance or its benchmark. To that end, Bridgewater demonstrates whether its strategies are operating as expected via a cone chart, which shows the performance of a particular strategy over time relative to the strategy's benchmark and also within bands of standard deviation from that benchmark. Separately, to demonstrate the impact of market conditions on the strategies it manages, Bridgewater explains the macro-economic pressures and market conditions that effected performance in the context of client letters, account reviews, or other publications that Bridgewater provides to each current and prospective investor on a regular basis. Additional information about how Bridgewater thinks about setting expectations for its strategies via a benchmark is available upon request.

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ALL WEATHER CHINA ASSET MIX DISCLOSURE

All Weather China Asset Mix (Net of Fees)

	Hedged to USD Total Return in USD	Hedged to RMB Total Return in RMB
Last 1 Year	13.7%	14.7%
Last 3 Years	7.6%	9.7%
Last 5 Years	5.2%	7.8%
Last 7 Years	5.0%	7.9%
Last 10 Years	3.1%	5.9%

Annualized Returns (Aug-02 through Oct-20)

Net Since Inception Aug-02 through Oct-20

	Hedged to USD Total Return in USD	Hedged to RMB Total Return in RMB
Annualized Return	8.8%	10.4%
Standard Deviation	11.2%	11.1%
Sharpe Ratio	0.67	0.71

Standard deviation is calculated using gross of fees performance. Past results are not necessarily indicative of future results. HYPOTHETICAL PERFORMANCE RESULTS HAVE MANY INHERENT LIMITATIONS, SOME OF WHICH ARE DESCRIBED BELOW. NO REPRESENTATION IS BEING MADE THAT ANY ACCOUNT WILL OR IS LIKELY TO ACHIEVE PROFITS OR LOSSES SIMILAR TO THOSE SHOWN. IN FACT, THERE ARE FREQUENTLY SHARP DIFFERENCES BETWEEN HYPOTHETICAL PERFORMANCE RESULTS AND THE ACTUAL RESULTS SUBSEQUENTLY ACHIEVED BY ANY PARTICULAR TRADING PROGRAM.

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All Weather China Asset Mix Simulation Performance Disclosure

Where shown all performance of the All Weather China Asset Mix is based on simulated, hypothetical performance and not the returns of any Bridgewater strategy. Bridgewater's investment selection and trading strategies are systematic and rules-based. However, they are not fully automated and they do include human input. As a result, back-tested returns are designed based on assumptions about how Bridgewater would have implemented the All Weather China Strategy prior to its existence. These assumptions are intended to approximate such implementation, but are inherently speculative.

The simulated performance for the All Weather China Asset Mix was derived by applying Bridgewater's current investment systems and portfolio construction logic to historical market returns across the markets currently selected to be included in the All Weather China Strategy. A list of the markets used appears below. We use actual market returns when available as an input for our hypothetical returns and otherwise use Bridgewater Associates' proprietary estimates, based on other available data and our fundamental understanding of asset classes. In certain cases, market data for an exposure which otherwise would exist in the simulation may be omitted if the relevant data is unavailable, deemed unreliable, immaterial or accounted for using proxies. Proxies are assets that existed and for which data is available, which Bridgewater believes would approximate returns for an asset that did not exist or for which reliable data is not available. For example, in the All Weather China Strategy we hold bonds across the yield curve, but we use an index of 7-10 year maturity bond returns for the purpose of simulation. Examples of omitted markets or accounted for using proxies include, but are not limited to, certain nominal bonds, equities, and commodities. We simulate as far back as we can based on the availability of reasonable data and proxies. Additionally, the mix and weightings of markets traded for the All Weather China Strategy are subject to change in the future.

Simulated asset returns are subject to considerable uncertainty and potential error, as a great deal cannot be known about how assets would have performed in the absence of actual returns. The All Weather China Asset Mix is an approximation of our intended process but not an exact replication and may have differences including but not limited to the precise mix of markets used and the weights applied to those markets. It is expected that the simulated performance will periodically change as a function of both refinements to our simulation methodology (including the addition/removal of asset classes) and the underlying market data. There is no guarantee that previous results would not be materially different. Future strategy changes could materially change previous simulated returns in order to reflect the changes accurately across time.

Transaction costs are accounted for and are estimates themselves based on historical measured costs and/or modeled costs. Actual transaction costs experienced could have been higher or lower than those reflected. Where noted, the All Weather China Asset Mix net of fees returns have been calculated using our standard fee schedule for a minimum size account, which are the highest fees we have or would currently charge an account. Investment advisory fees are described in Bridgewater's ADV Part 2A. Gross of fees performance (i) excludes the deduction of management fees, and other operating expenses (the "fees and expenses") and (ii) includes the reinvestment of interest, gains and losses. Including the fees and expenses would lower performance. There is no guarantee regarding the All Weather China Strategy's ability to perform in absolute returns or relative to any market in the future, during market events not represented or during market events occurring in the future. Market conditions and events vary considerably, are unpredictable and can have unforeseen impacts resulting in materially adverse results.

Markets included in the All Weather China Asset Mix

The All Weather China Asset Mix includes returns from the following markets: Chinese nominal interest rates, global inflation-linked bonds, Chinese equities, gold, and other commodities.

ALL WEATHER ASSET MIX DISCLOSURE

All Weather Asset Mix Performance (Net of Fees)

	Total Return in USD
Last 1 Year	12.4%
Last 3 Years	9.6%
Last 5 Years	8.9%
Last 7 Years	7.7%
Last 10 Years	7.6%

Annualized Returns (Jan-70 through Oct-20)

Net Since Inception Jan-70 through Oct-20

	Total Return in USD
Annualized Return	12.2%
Standard Deviation	11.0%
Sharpe Ratio	0.67

Standard deviation is calculated using gross of fees performance. Past results are not necessarily indicative of future results. HYPOTHETICAL PERFORMANCE RESULTS HAVE MANY INHERENT LIMITATIONS, SOME OF WHICH ARE DESCRIBED BELOW. NO REPRESENTATION IS BEING MADE THAT ANY ACCOUNT WILL OR IS LIKELY TO ACHIEVE PROFITS OR LOSSES SIMILAR TO THOSE SHOWN. IN FACT, THERE ARE FREQUENTLY SHARP DIFFERENCES BETWEEN HYPOTHETICAL PERFORMANCE RESULTS AND THE ACTUAL RESULTS SUBSEQUENTLY ACHIEVED BY ANY PARTICULAR TRADING PROGRAM.

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All Weather Asset Mix Simulation Performance Disclosure

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The simulated performance for the All Weather Asset Mix was derived by applying Bridgewater's current investment systems and portfolio construction logic to historical market returns across the markets selected for the All Weather Asset Mix. A list of the markets used appears below. We use actual market returns when available as an input for our hypothetical returns and otherwise use Bridgewater Associates' proprietary estimates, based on other available data and our fundamental understanding of asset classes. In certain cases, market data for an exposure which otherwise would exist in the simulation may be omitted if the relevant data is unavailable, deemed unreliable, immaterial or accounted for using proxies. Proxies are assets that existed and for which data is available, which Bridgewater believes would approximate returns for an asset that did not exist or for which reliable data is not available. For example, before reliable commodity futures returns data can be found Bridgewater estimates futures returns by using the spot commodity returns and their typical relationship to futures returns. Examples of omitted markets or accounted for using proxies include, but are not limited to, emerging market equities, emerging market debt, and certain commodities. The mix and weightings of markets traded for All Weather Asset Mix are subject to change in the future.

The All Weather Asset Mix includes periodic adjustments that are made to the All Weather Asset Mix desired strategic asset allocation pursuant to a subset of Bridgewater's systematic strategic management process. This process systematically adjusts exposures as needed to maintain our implementation of balance. The All Weather Asset Mix maintains the target level of risk regardless of market conditions. Accordingly, the All Weather Asset Mix does not alter the target level of risk based on the strategic management process employed in the All Weather Strategy. When applicable, the returns of the All Weather Asset Mix reflect adjustments based on this systematic strategic management process.

Simulated asset returns are subject to considerable uncertainty and potential error, as a great deal cannot be known about how assets would have performed in the absence of actual returns. The All Weather Asset Mix is an approximation of our current process but not an exact replication and may have differences including but not limited to the precise mix of markets used and the weights applied to those markets. It is expected that the simulated performance will periodically change as a function of both refinements to our simulation methodology (including the addition/removal of asset classes) and the underlying market data. There is no guarantee that previous results would not be materially different. Future strategy changes could materially change previous simulated returns in order to reflect the changes accurately across time.

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Markets included in the All Weather Asset Mix Simulation

The All Weather Asset Mix Simulation includes returns from the following markets: global nominal interest rates, global inflation linked bonds, emerging market credit spreads, corporate credit spreads, global equities, and commodities.

PURE ALPHA STRATEGY 18% USD DISCLOSURES

Pure Alpha Strategy Performance (Net of Fees)
(18% Target Volatility)

	Total Return in USD
Last 1 Year	-17.5%
Last 3 Years	-3.3%
Last 5 Years	-1.9%
Last 7 Years	0.0%
Last 10 Years	3.6%

Annualized Returns (Dec-91 through Oct-20)

Net Since Inception Dec-91 through Oct-20

Annualized Total Return	10.3%
Standard Deviation	15.0%
Information Ratio	0.51

Past results are not necessarily indicative of future results.

Standard deviation is calculated using gross of fees performance.

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Bridgewater Pure Alpha Strategy 18% Volatility Performance Disclosure:
Returns after April 2005 are the actual returns of the longest running fully funded Pure Alpha account with a target tracking error of 18%, a United States cash benchmark, and fully unconstrained active management guidelines. From December 1991 through the end of April 2005 the performance history provided is based on the performance of the Pure Alpha strategy run at a 12% target volatility. A description of the 12% target volatility performance is provided below. The value added (or excess returns) of the 12% target volatility gross of fees performance history have been scaled to an 18% target volatility. Monthly value added returns are scaled linearly by a factor of 1.5 (18% divided by 12%). The Benchmark return (an approximation of US cash) is subsequently added back to the adjusted value added to arrive at a total return. For the entire period the Benchmark is an approximation of US cash. Due to the effects of compounding, annualized historical returns, volatilities, and information ratios will not scale linearly. The returns are considered simulated or hypothetical.

Bridgewater Pure Alpha Strategy 12% Volatility Gross Performance Disclosure:
The performance history provided is based on actual Bridgewater Pure Alpha accounts. Returns since the strategy's inception in December 1991 through April 1999 are based on the actual performance of a partially funded account (where interest income has been removed to arrive at the excess returns), and are adjusted to include the imputed interest return on the full notional value using the US repo rate. Returns from May 1999 through present are the actual returns of the longest running fully funded Pure Alpha account with a target tracking error of 12%, an approximation of an United States cash benchmark, and fully unconstrained active management guidelines. Bridgewater manages additional Pure Alpha portfolios not included in this performance history.

Gross of fees performance is gross of management and performance fees only and includes the reinvestment of interest, gains, and losses.

Net of fees performance for the entire period shown have been calculated by applying our standard Pure Alpha 18% Volatility Strategy fee schedule, which are the highest fees charged. Investment advisory fees are described in Bridgewater's ADV Part 2A. From December 1991 through June 2008, using a monthly high water concept (and after June 2008, using a quarterly high water concept), deduction of incentive fees may vary and may be higher or lower than the fees actually charged to the account for the same time period. These returns reflect all fees (which are at our Pure Alpha standard rates), expenses and interest actually charged or credited to the account.

No representation is being made that any account will or is likely to achieve returns similar to those shown. Trading in futures is risky and can result in losses as well as profits. PAST RESULTS ARE NOT NECESSARILY INDICATIVE OF FUTURE RESULTS. Performance as of the current month is estimated and subject to change.

ILLUSTRATIVE BASE PORTFOLIO

This page contains the allocation information for the historical simulation of the Illustrative Base Portfolio, from 1970 onwards, as well as forward looking assumptions for expected returns, volatility, tracking error, and correlations used in this analysis. The portfolio capital allocation weights (illustrated below) are estimates based either upon Bridgewater Associates' understanding of standard asset allocation (which may change without notice) or information provided by or publicly available from the recipient of this presentation. Asset class returns are actual market returns where available and otherwise a proxy index constructed based on Bridgewater Associates understanding of global financial markets. Information regarding specific indices and simulation methods used for proxies is available upon request (except where the proprietary nature of information precludes its dissemination). Results are hypothetical or simulated and gross of fees unless otherwise indicated. HYPOTHETICAL PERFORMANCE RESULTS HAVE MANY INHERENT LIMITATIONS, SOME OF WHICH ARE DESCRIBED BELOW. NO REPRESENTATION IS BEING MADE THAT ANY ACCOUNT WILL OR IS LIKELY TO ACHIEVE PROFITS OR LOSSES SIMILAR TO THOSE SHOWN. IN FACT, THERE ARE FREQUENTLY SHARP DIFFERENCES BETWEEN HYPOTHETICAL PERFORMANCE RESULTS AND THE ACTUAL RESULTS SUBSEQUENTLY ACHIEVED BY ANY PARTICULAR TRADING PROGRAM. ONE OF THE LIMITATIONS OF HYPOTHETICAL PERFORMANCE RESULTS IS THAT THEY ARE GENERALLY PREPARED WITH THE BENEFIT OF HINDSIGHT. IN ADDITION, HYPOTHETICAL TRADING DOES NOT INVOLVE FINANCIAL RISK, AND NO HYPOTHETICAL TRADING RECORD CAN COMPLETELY ACCOUNT FOR THE IMPACT OF FINANCIAL RISK IN ACTUAL TRADING. FOR EXAMPLE, THE ABILITY TO WITHSTAND LOSSES OR TO ADHERE TO A PARTICULAR TRADING PROGRAM IN SPITE OF TRADING LOSSES ARE MATERIAL POINTS WHICH CAN ALSO ADVERSELY AFFECT ACTUAL TRADING RESULTS. THERE ARE NUMEROUS OTHER FACTORS RELATED TO THE MARKETS IN GENERAL OR TO THE IMPLEMENTATION OF ANY SPECIFIC TRADING PROGRAM WHICH CANNOT BE FULLY ACCOUNTED FOR IN THE PREPARATION OF HYPOTHETICAL PERFORMANCE RESULTS AND ALL OF WHICH CAN ADVERSELY AFFECT ACTUAL TRADING RESULTS.

Asset Type	Asset	Nominal Exposure	% Hedged FX	Beta Volatility	Beta Ratio	Alpha Volatility	Alpha Ratio
Equities	Developed World Ex US Equities	18.0%	0%	14.9%	0.29	5.0%	0.3
Equities	United States Equities Broad	15.0%	0%	16.5%	0.25	-	-
Equities	United States Equities Broad	15.0%	0%	16.5%	0.25	5.0%	0.25
Equities	United States PE	9.0%	0%	26.7%	0.25	10.0%	0.25
MBS	United States MBS	6.0%	0%	3.9%	0.25	2.0%	0.25
Hedge Fund	Hedge Fund	5.0%	0%	-	-	7.0%	0.5
Real Estate	United States Real Estate	5.0%	0%	19.9%	0.25	6.0%	0.25
Corporate Bonds	United States Corporate Bonds	5.0%	0%	7.3%	0.3	3.0%	0.25
Nominal Government Bonds	United States Govt Bonds	4.5%	0%	4.8%	0.25	-	-
Nominal Government Bonds	United States Govt Bonds	4.5%	0%	4.8%	0.25	2.0%	0.25
Equities	Emerging Market Equities	3.0%	0%	21.1%	0.25	5.0%	0.3
Commodities	Bloomberg Commodity Index	2.0%	0%	17.4%	0.2	-	-
High Yield Bonds	United States High Yield Bonds	2.0%	0%	11.4%	0.3	4.0%	0.25
Real Estate	Developed World Real Estate	2.0%	0%	18.0%	0.31	6.0%	0.3
Nominal Government Bonds	Developed World Ex US Govt Bonds	2.0%	100%	4.1%	0.31	2.0%	0.3
IL Bonds	United States IL Bonds	1.0%	0%	6.0%	0.25	-	-
IL Bonds	United States IL Bonds	1.0%	0%	6.0%	0.25	1.0%	0.25

INFLATION PROTECTION + ALPHA

This page contains the allocation information for the historical simulation of the Inflation Protection + Alpha Portfolio, from 1970 onwards, as well as forward looking assumptions for expected returns, volatility, tracking error, and correlations used in this analysis. The portfolio capital allocation weights (illustrated below) are estimates based either upon Bridgewater Associates' understanding of standard asset allocation (which may change without notice) or information provided by or publicly available from the recipient of this presentation. Asset class returns are actual market returns where available and otherwise a proxy index constructed based on Bridgewater Associates understanding of global financial markets. Information regarding specific indices and simulation methods used for proxies is available upon request (except where the proprietary nature of information precludes its dissemination). Results are hypothetical or simulated and gross of fees unless otherwise indicated. HYPOTHETICAL PERFORMANCE RESULTS HAVE MANY INHERENT LIMITATIONS, SOME OF WHICH ARE DESCRIBED BELOW. NO REPRESENTATION IS BEING MADE THAT ANY ACCOUNT WILL OR IS LIKELY TO ACHIEVE PROFITS OR LOSSES SIMILAR TO THOSE SHOWN. IN FACT, THERE ARE FREQUENTLY SHARP DIFFERENCES BETWEEN HYPOTHETICAL PERFORMANCE RESULTS AND THE ACTUAL RESULTS SUBSEQUENTLY ACHIEVED BY ANY PARTICULAR TRADING PROGRAM. ONE OF THE LIMITATIONS OF HYPOTHETICAL PERFORMANCE RESULTS IS THAT THEY ARE GENERALLY PREPARED WITH THE BENEFIT OF HINDSIGHT. IN ADDITION, HYPOTHETICAL TRADING DOES NOT INVOLVE FINANCIAL RISK, AND NO HYPOTHETICAL TRADING RECORD CAN COMPLETELY ACCOUNT FOR THE IMPACT OF FINANCIAL RISK IN ACTUAL TRADING. FOR EXAMPLE, THE ABILITY TO WITHSTAND LOSSES OR TO ADHERE TO A PARTICULAR TRADING PROGRAM IN SPITE OF TRADING LOSSES ARE MATERIAL POINTS WHICH CAN ALSO ADVERSELY AFFECT ACTUAL TRADING RESULTS. THERE ARE NUMEROUS OTHER FACTORS RELATED TO THE MARKETS IN GENERAL OR TO THE IMPLEMENTATION OF ANY SPECIFIC TRADING PROGRAM WHICH CANNOT BE FULLY ACCOUNTED FOR IN THE PREPARATION OF HYPOTHETICAL PERFORMANCE RESULTS AND ALL OF WHICH CAN ADVERSELY AFFECT ACTUAL TRADING RESULTS.

Asset Type	Asset	Nominal Exposure	% Hedged FX	Beta Volatility	Beta Ratio	Alpha Volatility	Alpha Ratio
IL Bonds	Developed World IL Bonds	150.0%	100%	5.2%	0.3	-	-
Commodities	Gold	45.0%	0%	17.6%	-0.09	-	-
Pure Alpha	Pure Alpha 18% Net	33.3%	0%	-	-	18.0%	0.67

Callan

December 3, 2020

ARMB Board Meeting

Preliminary Investment Performance
Periods Ended September 30, 2020

Steve Center, CFA
Senior Vice President

Paul Erlendson
Senior Vice President

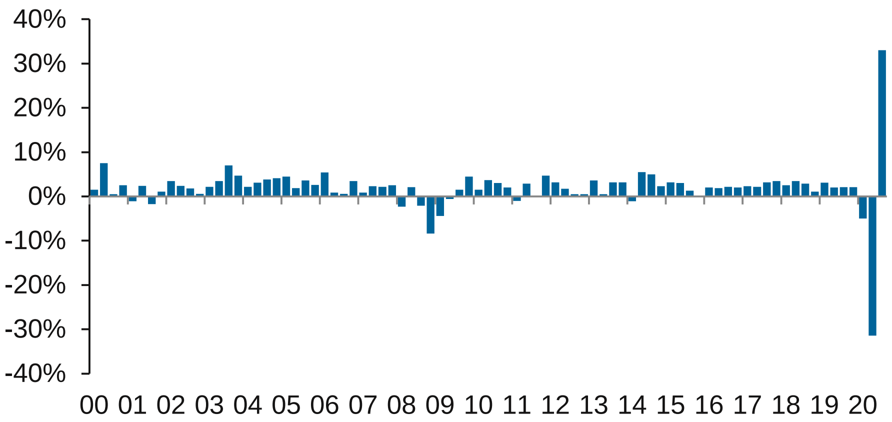
Agenda

- Market and Economic Environment
- Total Fund Performance
  - Defined Benefit Plans' Major Asset Classes
  - Participant-Directed Plans

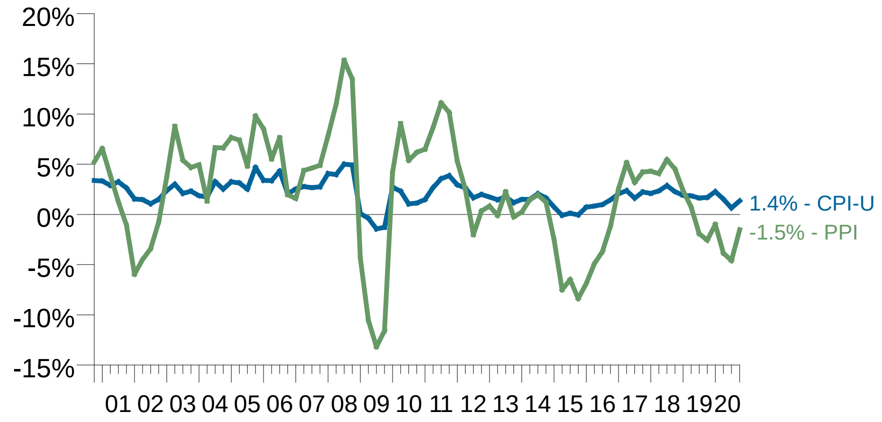
U.S. Economy—Summary

For periods ended 9/30/20

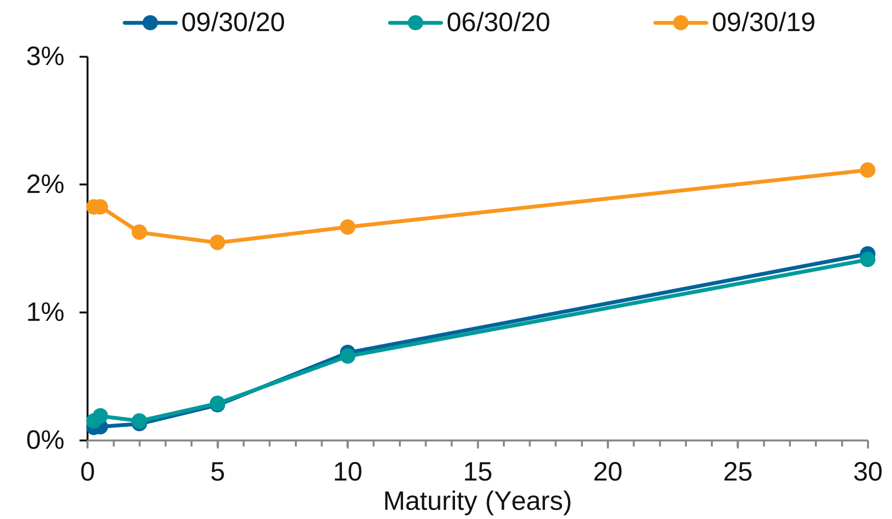
Quarterly Real GDP Growth*



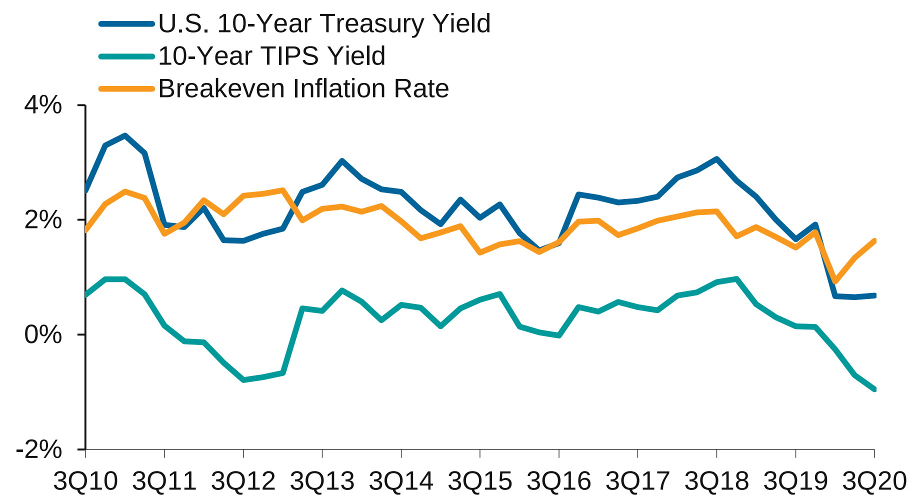
Inflation Year-Over-Year



U.S. Treasury Yield Curves



Historical 10-Year Yields



*Preliminary estimate for 3Q20. Sources: Bloomberg, Bureau of Labor Statistics, Callan, IHS Markit

Market Environment: 3Q20

High degree of uncertainty

U.S.

– 2Q GDP fell -31.4%, largest decline on record; 3Q gain of 33%

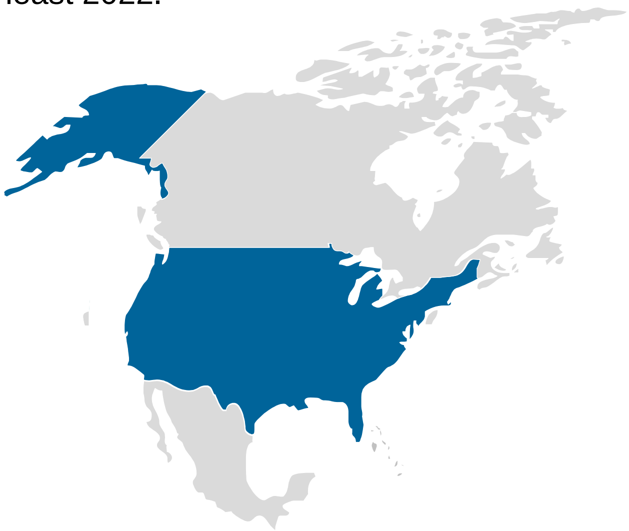
– Retail sales, durable goods, and personal spending rebounded in 2Q and 3Q, but growth slowed in August and September.

– Unemployment dropped to 7.9% in September from 14.7% April peak.

  – *Jobless claims decelerated to less than 1 million per week, but are still elevated relative to prior recession peaks.*

– Housing benefiting from relatively low mortgage rates

– Fed left rates close to 0% and expects to be on hold until at least 2022.



Overseas

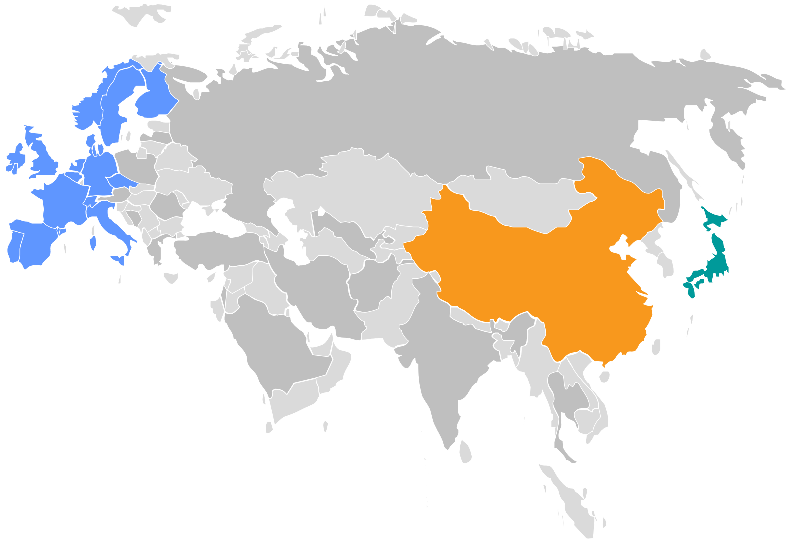
– Euro zone 1Q GDP contracted 3.7%, followed by 11.2% drop in 2Q; largest quarterly drop on record.

– U.K. GDP sank 20% in 2Q—most ever.

– Japan's economy shrank 7.9% in 2Q; third straight quarterly drop, dating back to 2019.

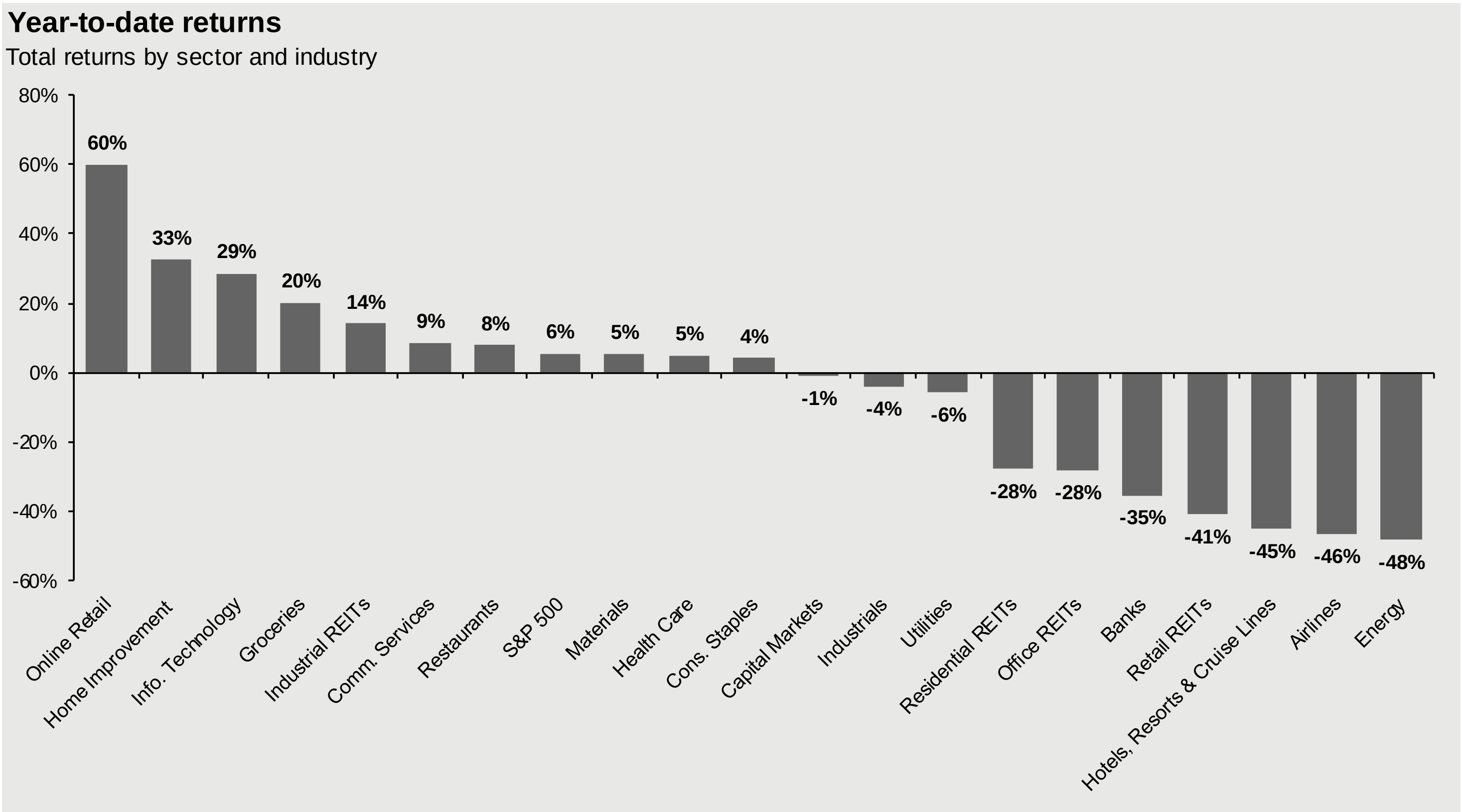
– China's GDP fell 6.8% in 1Q, but rebounded 3.2% in 2Q and is up 4.9% in 3Q; only country expected to grow in 2020.

  – *Chinese government unveiled fiscal stimulus of US$506 bn, bringing budget deficit to a record high of 3.6% of GDP.*



U.S. Stock Market Returns YTD Are Widely Dispersed

Concentration of outperformance in technology, online retail, and supporting industries

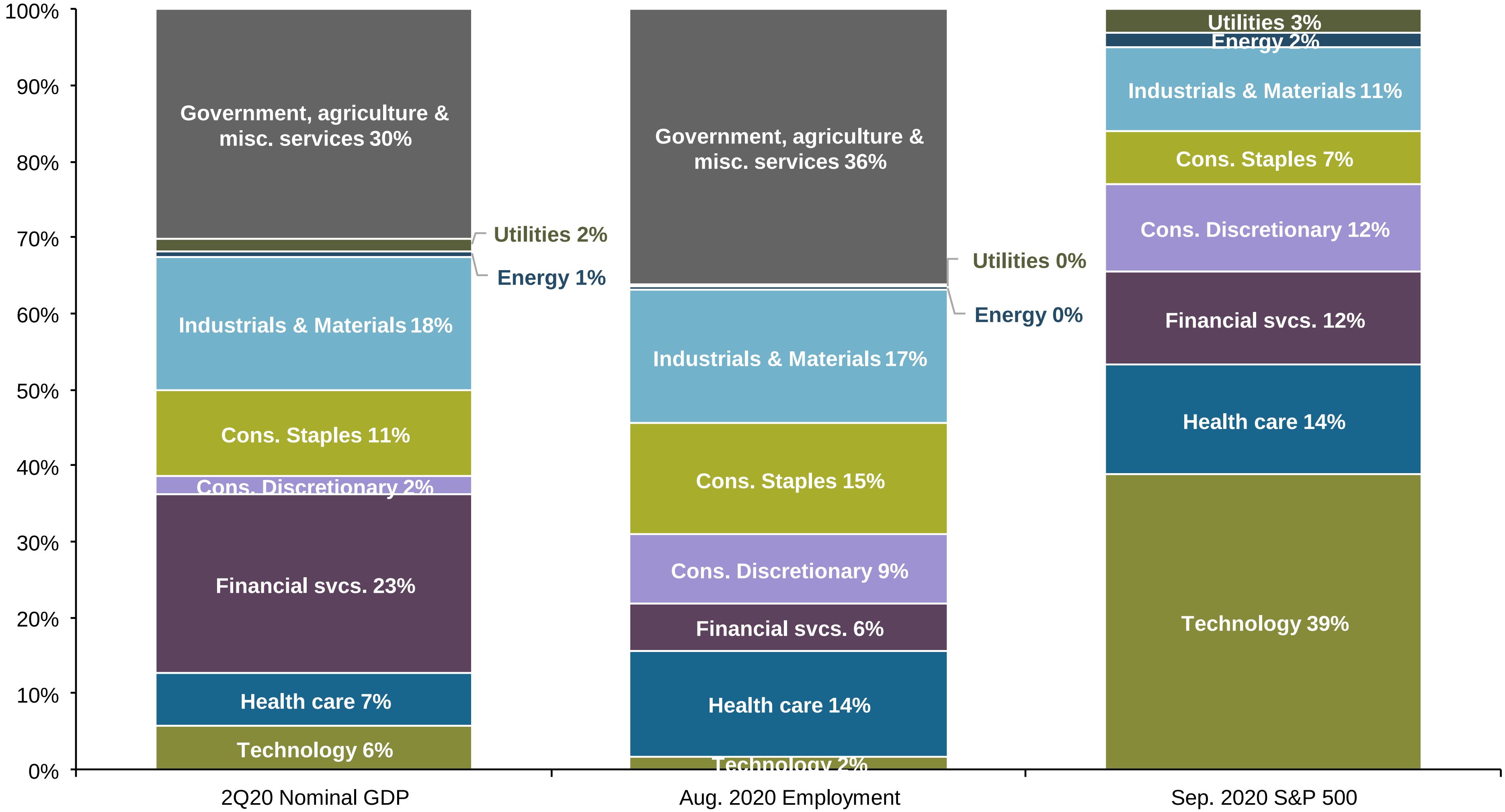


Best-performing sectors employ far fewer workers than many of the underperforming sectors (health care, capital markets, banks, hospitality, transportation, energy)

Source: FactSet, Standard & Poor's, J.P. Morgan Asset Management.
Guide to the Markets – U.S. Data are as of September 30, 2020.

The Stock Market Is Not the Economy

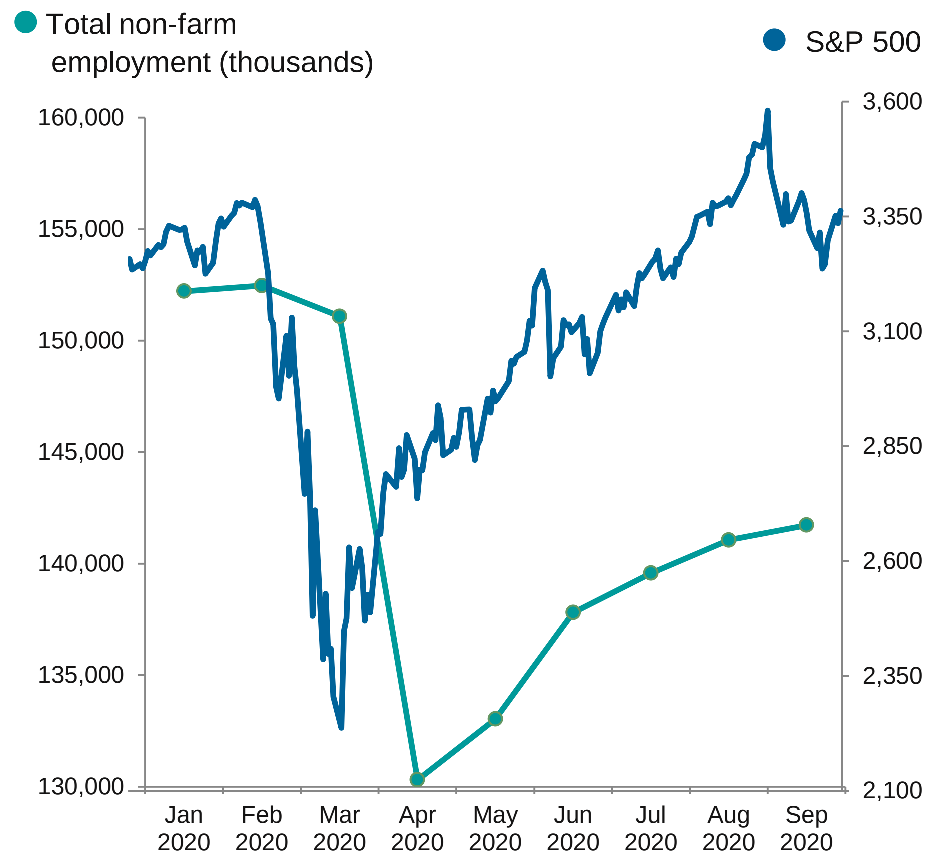
Sector share of GDP, employment and S&P 500



Source: Bureau of Economic Analysis, Bureau of Labor Statistics, Standard & Poor's, J.P. Morgan Asset Management. Technology: information (economy, employment), technology and communication services (S&P 500). Financial services includes real estate (S&P 500). Consumer discretionary: Arts, entertainment, recreation, accommodation, and food services (economy), leisure and hospitality (employment). Consumer staples: wholesale trade and retail trade (economy, employment). Industrials and materials: construction, manufacturing, transportation and warehousing (economy, employment). Energy: mining (economy), mining and logging (employment). Government, agriculture & misc. services: government, other services, professional and business services, education and agriculture, forestry, fishing, and hunting (economy), government, other services, professional and business services, and education (employment). Guide to the Markets – U.S. Data are as of September 30, 2020.

The Stock Market Is Not the Economy

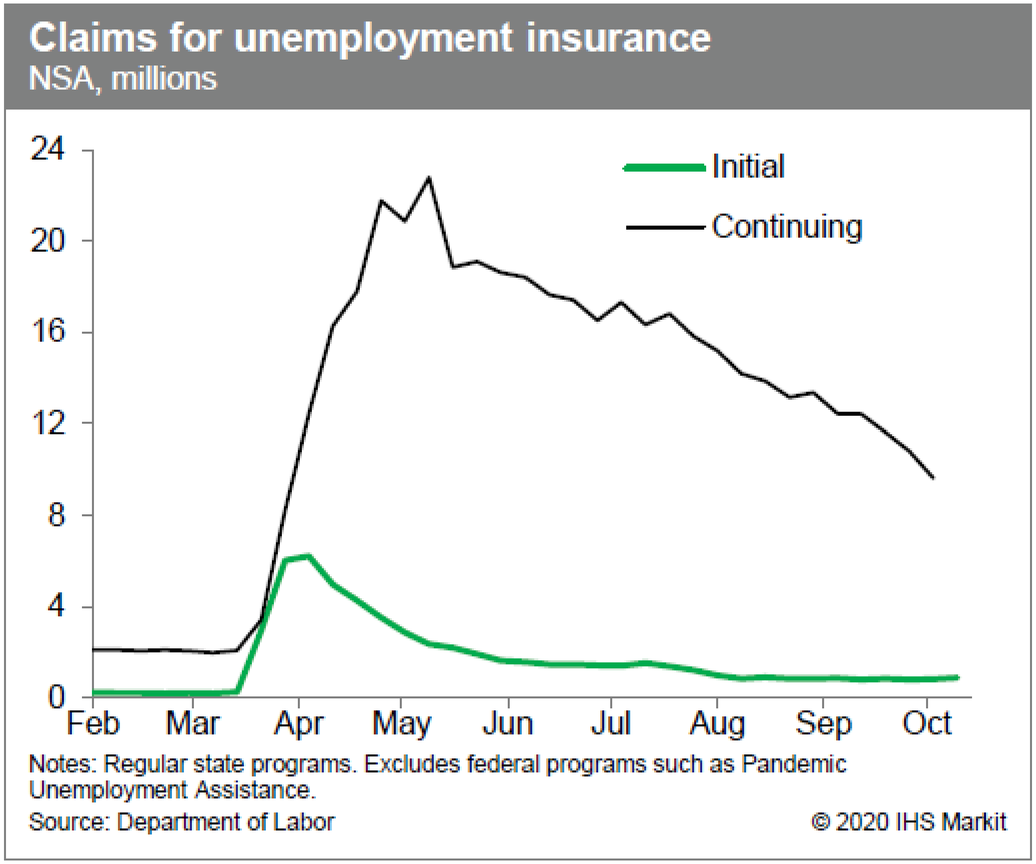
- U.S. equity market has already recovered from the March 2020 plunge and is up 5.6% year-to-date through September 2020
- The job market lost over 20 million jobs in March and April, and has recovered only half since May
- GDP is projected to remain below the February 2020 pre-COVID peak until late 2021 or into 2022
- Steep structural challenges face many job-laden sectors of the economy that are underrepresented in the current stock market valuation
- Stimulus benefit to unemployed and to employers carried through 3Q; without extension of benefits, recovery may face a serious slowdown in 4Q and into 2021



U.S. Job Market

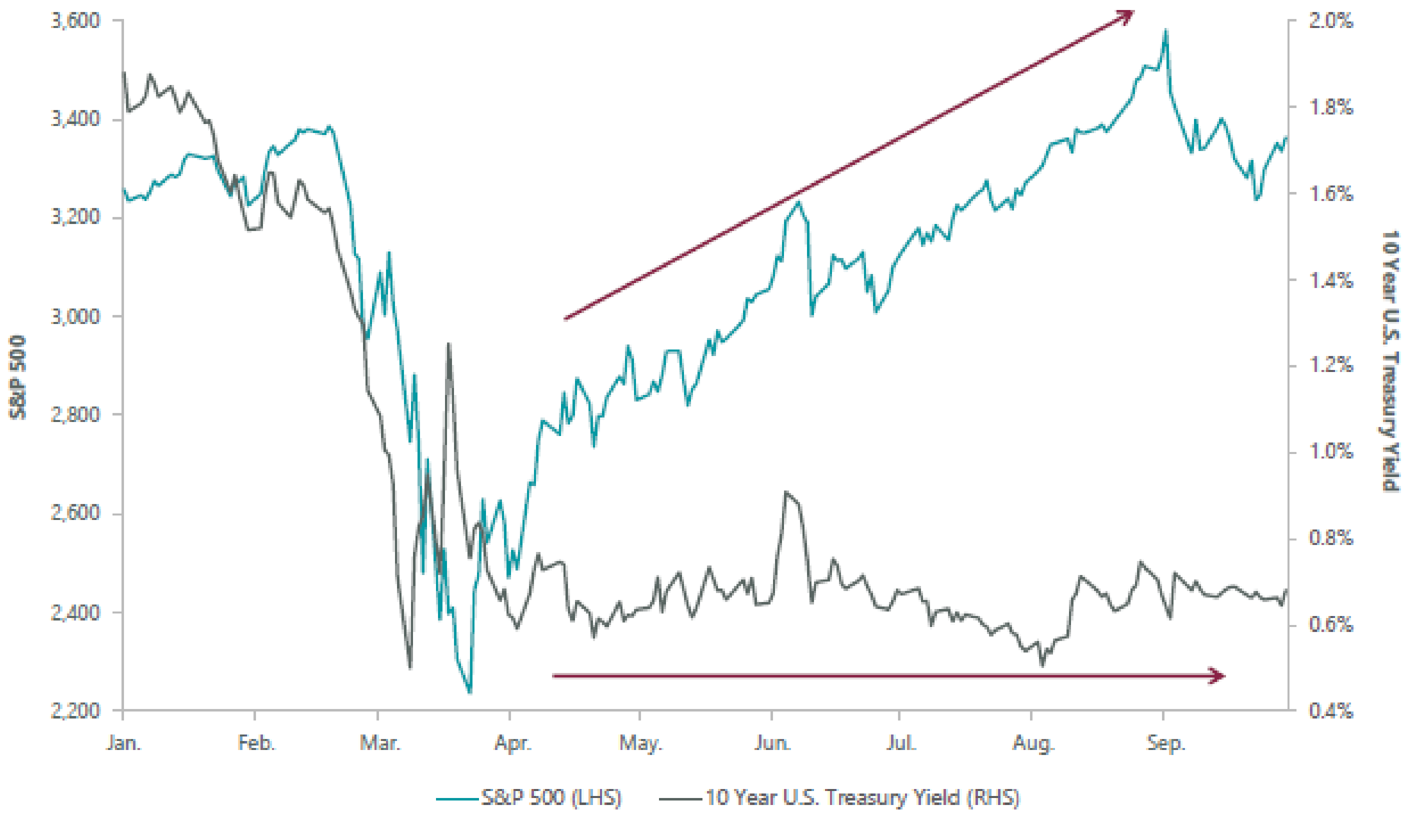
Initial claims and total unemployed

- Spike in initial claims to over 6 *million* per week in April
- Subsided into 3Q, but remain stubbornly high at 837,000 in September
  - *Far above prior periods of stress*
  - *665,000 in March 2009*
- Over 40 million thrown out of work, from a starting payroll count of 155 million in February
  - *State unemployment rolls captured 23 million of those jobs lost*
  - *Federal Pandemic Unemployment Assistance aided millions more*
- Job increases (>10 million) surprised on the upside during 3Q
- Household finances sustained through 3Q by expanded unemployment benefits, extra payments, and federal transfer payments
- Uncertainty over UI benefit extensions and further fiscal stimulus for individuals and small business form a dark cloud over continuing recovery in 4Q and 2021



Source: IHS Markit; Department of Labor

Not All Markets Have Priced in the Recovery



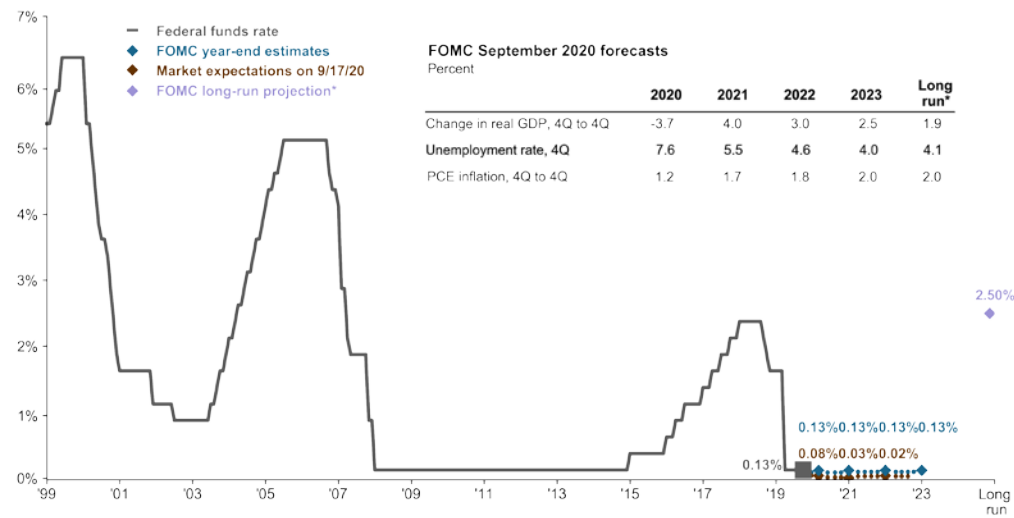
– Treasuries began to sell off before equities in response to coronavirus risks.
– Yields have remained near trough levels through the stock market rally.

Data as of 9/30/20
Sources: ClearBridge Investments, FactSet.

Government Intervention

Monetary policy expected to remain loose for some time

- The Federal Reserve Open Market Committee voted to continue 0% Fed Funds Rate at September meeting.
- Median FOMC member forecast expects zero interest rate policy for years.
- Powell: “Fed is not even ***thinking*** about ***thinking*** about raising rates.”
- Fed announced new inflation targeting regime, with willingness to overshoot target to get desired outcome of 2%.
- Markets do not expect the Fed to raise the rate in the near future.
- “Longer run” projection of 2.5% for Fed Funds Rate has no specific anchor date.



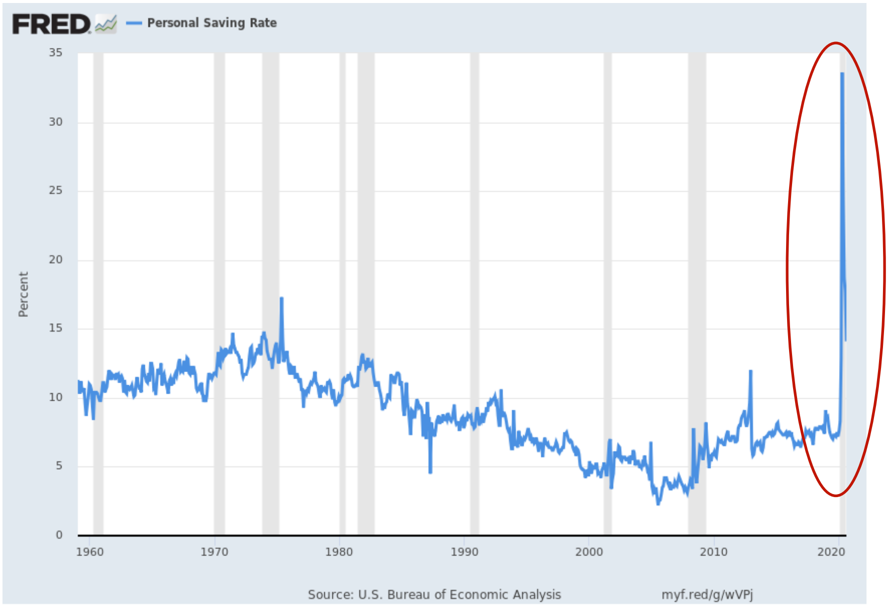
	2020	2021	2022	2023	Long run*
Change in real GDP, 4Q to 4Q	-3.7	4.0	3.0	2.5	1.9
Unemployment rate, 4Q	**7.6**	**5.5**	**4.6**	**4.0**	**4.1**
PCE inflation, 4Q to 4Q	1.2	1.7	1.8	2.0	2.0

Source: Federal Reserve, J.P. Morgan Guide to the Markets U.S. Data are as of September 30, 2020

Liquidity Supporting Economy (and Driving Markets)

Consumers = more money, fewer problems; investors = dry powder abundant

U.S. Personal Savings Rate



Cash as % of Equity Market Cap

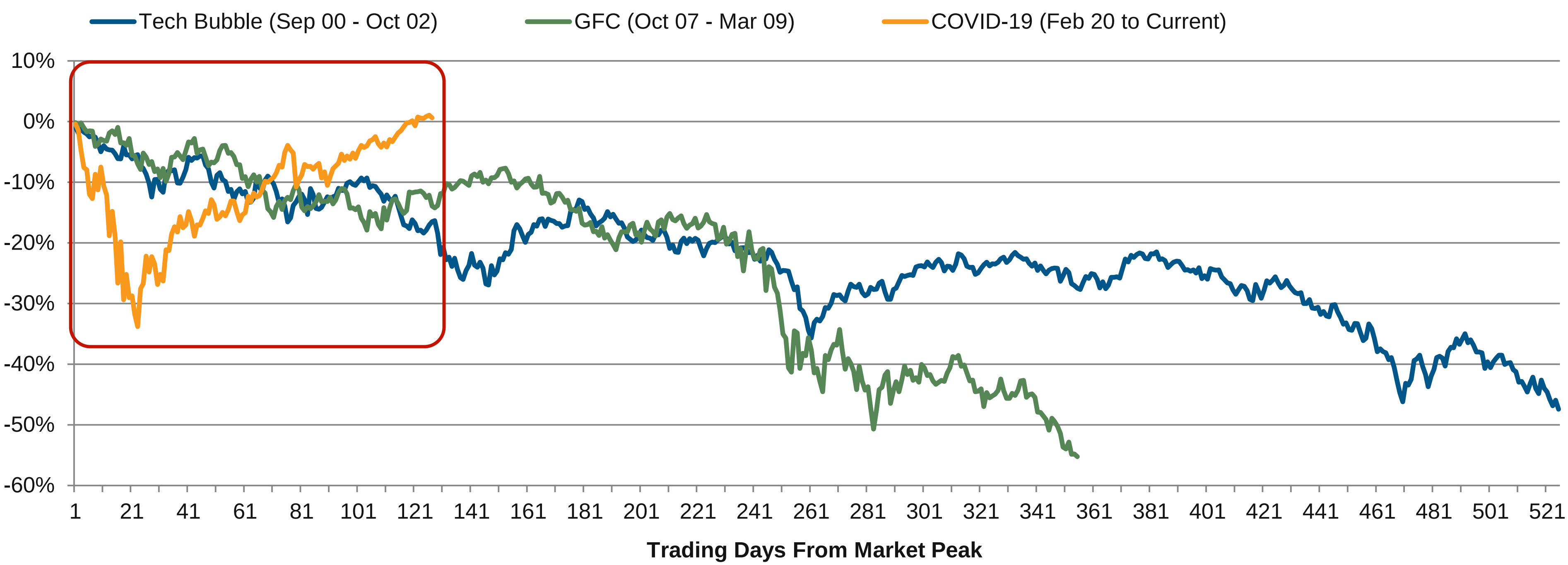
– U.S. personal savings rate far exceeds levels seen in the post-WWII era.
– Savings will help insulate consumer spending during economic wobbles and through uncertainty around future fiscal stimulus.
– Investor cash holdings at 16% of total equity market cap, highest level since 2012

Sources: ClearBridge Investments, FactSet, Federal Reserve. Cash = Institutional and Retail Money Funds – ICL; Equity = MSCI U.S. IMI

Unprecedented Shock to Global Capital Markets—Is It Over Already?

V-shaped recovery in equity—back in black by mid-August!

S&P 500 Index Cumulative Returns
Market Peak-to-Trough for Recent Corrections vs.
Current Path of COVID-19 Correction Through 8/19/20



– The sharpest and fastest equity market decline ever: 16 trading days to reach bear market; -33% after just 23 days
– Incredible rebound in U.S. equity market in 2Q and 3Q
  – *The S&P 500 recovered all of its COVID-19 related losses by Aug. 10, only 97 days from the bottom.*
  – *Positive return year-to-date (+5.6% through 9/30/20)*

Sources: Callan, S&P Dow Jones Indices

Callan Periodic Table of Investment Returns

Annual Returns			Monthly Returns									
2017	**2018**	**2019**	**Jan 2020**	**Feb 2020**	**Mar 2020**	**Apr 2020**	**May 2020**	**Jun 2020**	**Jul 2020**	**Aug 2020**	**Sep 2020**	**YTD 2020**
Emerging Market Equity **37.28%**	U.S. Fixed Income **0.01%**	Large Cap Equity **31.49%**	U.S. Fixed Income **1.92%**	U.S. Fixed Income **1.80%**	U.S. Fixed Income **-0.59%**	Small Cap Equity **13.74%**	Small Cap Equity **6.51%**	Emerging Market Equity **7.35%**	Emerging Market Equity **8.94%**	Large Cap Equity **7.19%**	U.S. Fixed Income **-0.05%**	U.S. Fixed Income **6.79%**
Dev ex-U.S. Equity **24.21%**	High Yield **-2.08%**	Small Cap Equity **25.52%**	Real Estate **0.84%**	Global ex-U.S. Fixed Income **-0.20%**	Global ex-U.S. Fixed Income **-3.22%**	Large Cap Equity **12.82%**	Large Cap Equity **4.76%**	Small Cap Equity **3.53%**	Large Cap Equity **5.64%**	Small Cap Equity **5.63%**	Global ex-U.S. Fixed Income **-0.58%**	Large Cap Equity **5.57%**
Large Cap Equity **21.83%**	Global ex-U.S. Fixed Income **-2.15%**	Dev ex-U.S. Equity **22.49%**	Global ex-U.S. Fixed Income **0.76%**	High Yield **-1.41%**	High Yield **-11.46%**	Emerging Market Equity **9.16%**	High Yield **4.41%**	Dev ex-U.S. Equity **3.42%**	High Yield **4.69%**	Dev ex-U.S. Equity **5.16%**	High Yield **-1.03%**	Global ex-U.S. Fixed Income **4.77%**
Small Cap Equity **14.65%**	Large Cap Equity **-4.38%**	Real Estate **21.91%**	High Yield **0.03%**	Emerging Market Equity **-5.27%**	Large Cap Equity **-12.35%**	Real Estate **7.06%**	Dev ex-U.S. Equity **4.25%**	Real Estate **2.57%**	Global ex-U.S. Fixed Income **4.44%**	Real Estate **2.52%**	Emerging Market Equity **-1.60%**	High Yield **0.62%**
Global ex-U.S. Fixed Income **10.51%**	Real Estate **-5.63%**	Emerging Market Equity **18.44%**	Large Cap Equity **-0.04%**	Large Cap Equity **-8.23%**	Dev ex-U.S. Equity **-14.12%**	Dev ex-U.S. Equity **6.97%**	Emerging Market Equity **0.77%**	Large Cap Equity **1.99%**	Real Estate **2.78%**	Emerging Market Equity **2.21%**	Dev ex-U.S. Equity **-2.82%**	Emerging Market Equity **-1.16%**
Real Estate **10.36%**	Small Cap Equity **-11.01%**	High Yield **14.32%**	Dev ex-U.S. Equity **-1.94%**	Real Estate **-8.24%**	Emerging Market Equity **-15.40%**	High Yield **4.51%**	U.S. Fixed Income **0.47%**	Global ex-U.S. Fixed Income **1.01%**	Small Cap Equity **2.77%**	High Yield **0.95%**	Real Estate **-3.11%**	Dev ex-U.S. Equity **-7.13%**
High Yield **7.50%**	Dev ex-U.S. Equity **-14.09%**	U.S. Fixed Income **8.72%**	Small Cap Equity **-3.21%**	Small Cap Equity **-8.42%**	Small Cap Equity **-21.73%**	Global ex-U.S. Fixed Income **2.04%**	Global ex-U.S. Fixed Income **0.30%**	High Yield **0.98%**	Dev ex-U.S. Equity **2.66%**	Global ex-U.S. Fixed Income **0.29%**	Small Cap Equity **-3.34%**	Small Cap Equity **-8.69%**
U.S. Fixed Income **3.54%**	Emerging Market Equity **-14.57%**	Global ex-U.S. Fixed Income **5.09%**	Emerging Market Equity **-4.66%**	Dev ex-U.S. Equity **-8.88%**	Real Estate **-22.76%**	U.S. Fixed Income **1.78%**	Real Estate **0.23%**	U.S. Fixed Income **0.63%**	U.S. Fixed Income **1.49%**	U.S. Fixed Income **-0.81%**	Large Cap Equity **-3.80%**	Real Estate **-19.69%**

Sources: ● Bloomberg Barclays Aggregate ● Bloomberg Barclays Corp High Yield ● Bloomberg Barclays Global Aggregate ex US ● FTSE EPRA Nareit Developed ● MSCI World ex USA ● MSCI Emerging Markets ● Russell 2000 ● S&P 500

Stunning Recovery in Global Equity Markets in 3Q20

V-shaped equity rebound, ahead of the global economy

Global equity continued the rally in 3Q after March market bottom

- S&P -33.5% from peak (02/19/20) to low on 3/23/20
- Rebound since March puts S&P 500 even with February peak, suggesting broad-based recovery, but YTD results are concentrated in a few stocks.
- Fed cut rates to zero, commenced QE, instituted multiple facilities to backstop money markets, credit markets, and economy.
  - *Fed expects to get paid back.*
  - *Further fiscal stimulus expected*
- Congress passed fiscal stimulus (CARES) to carry the economy through the crisis.
- Economic recovery will be uncertain as COVID-19 infections surge anew; re-openings may be reversed.

Returns for Periods ended 9/30/20

	1 Quarter	1 Year	5 Years	10 Years	25 Years
U.S. Equity					
Russell 3000	9.21	15.00	13.69	13.48	9.29
S&P 500	8.93	15.15	14.15	13.74	9.31
Russell 2000	4.93	0.39	8.00	9.85	7.96
Global ex-U.S. Equity					
MSCI World ex USA	4.92	0.16	5.32	4.37	4.71
MSCI Emerging Markets	9.56	10.54	8.97	2.51	--
MSCI ACWI ex USA Small Cap	10.50	6.97	6.80	5.31	5.82
Fixed Income					
Bloomberg Barclays Aggregate	0.62	6.98	4.18	3.64	5.30
90-day T-Bill	0.04	1.10	1.20	0.64	2.32
Bloomberg Barclays Long Gov/Credit	1.22	12.92	8.78	7.36	7.66
Bloomberg Barclays Global Agg ex-US	4.14	5.48	3.60	1.35	3.90
Real Estate					
NCREIF Property	-0.99	0.25	5.91	9.18	9.01
FTSE Nareit Equity	1.44	-18.16	3.95	7.90	9.34
Alternatives					
CS Hedge Fund	3.44	2.41	2.76	3.64	7.25
Cambridge Private Equity*	9.89	7.67	11.36	13.38	14.86
Bloomberg Commodity	9.07	-8.20	-3.09	-6.03	0.91
Gold Spot Price	5.28	28.69	11.19	3.77	6.57
Inflation - CPI-U	0.96	1.37	1.81	1.77	2.14

*Cambridge PE data through 06/30/20
Sources: Bloomberg, Bloomberg Barclays, Callan, Cambridge, Credit Suisse, FTSE Russell, MSCI, NCREIF, S&P Dow Jones Indices

U.S. Equity Continues to Shine Amid Pandemic

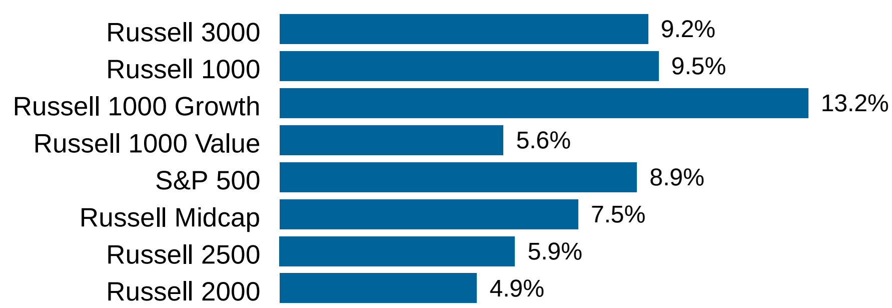
Gains YTD

- S&P +8.9% for the quarter, bringing YTD to +5.6%
  - *Consumer Discretionary (+15%) and Industrials (+13%) dominated, with Tech (+12%) a close third in risk-on market.*
  - *S&P 500 YTD would be negative if not for Facebook, Microsoft, Amazon, Alphabet, and Apple, representing 33% of the return.*
- YTD, pandemic punishing some sectors while rewarding others
  - *Tech +29% YTD; Cons. Disc. +23% (online retailers +60%)*
  - *Energy -48% amid declining crude and natural gas prices*
    - *Demand from hotels/cruise lines/airlines down as industries have dropped 40%+*

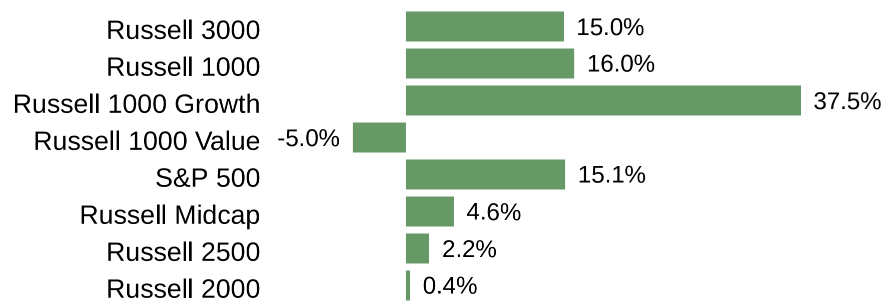
Small cap reverses to trail large cap

- Following a stellar 2Q20 recovery, small cap trailed large.
  - *Remains behind large cap by a wide margin over last 12 months*
- Growth continues to outpace value across market caps
- Growth, value dispersion near all-time high driven by Tech
  - *YTD RUS1G +25% vs. RUS1V -12%*
- Growth stock P/E near 2x historical average across market caps

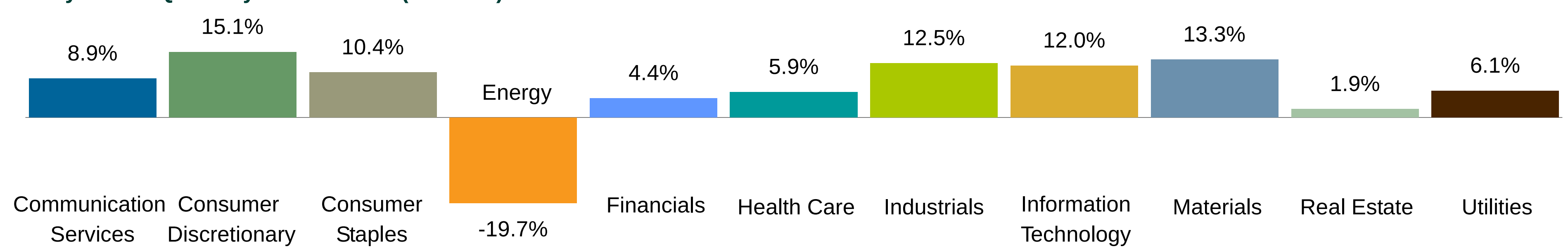
U.S. Equity: Quarterly Returns



U.S. Equity: One-Year Returns



Industry Sector Quarterly Performance (S&P 500)



Sources: FTSE Russell, S&P Dow Jones Indices

Global ex-U.S. Equity Performance

Continued recovery into 3Q20

- Returns broadly positive across developed and emerging markets but muted YTD
- Recent support from ultra-low interest rates and upward earnings revisions
- EM recovery driven by global risk-on environment; key countries within EM (China and South Korea) have better managed the pandemic
- Small cap continued to outperform large as lockdowns eased and business confidence improved.

Rebound for cyclicals

- Materials, Industrials, and Consumer Discretionary outperformed as consumption and production resumed.
- Factor performance led by momentum (rebound) and volatility (risk-on market mentality)

U.S. dollar vs. other currencies

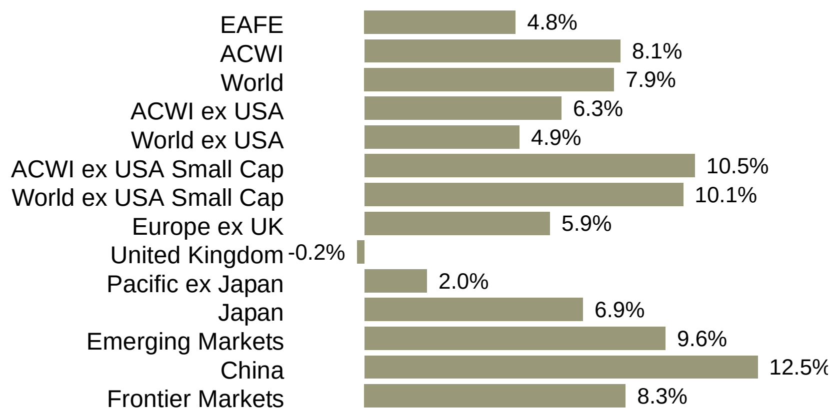
- U.S. dollar lost ground versus every developed market currency on expectation of lower-for-longer U.S. rates due to Fed's shift in approach toward inflation and employment.

Growth vs. value

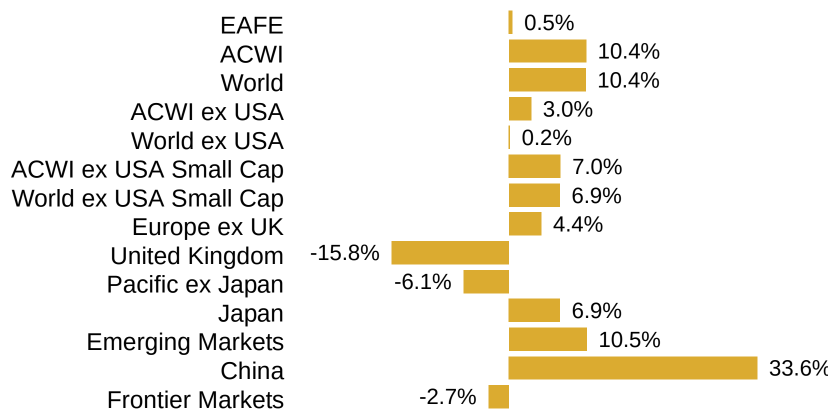
- Growth continued to outperform value.
- Extremely narrow market with performance dominated by Tech

Source: MSCI

Global Equity: Quarterly Returns



Global Equity: Annual Returns



U.S. Fixed Income Performance: 3Q20

Treasury yields largely unchanged

- 10-year UST yield at 0.69% in 3Q20, up 3 bps from 2Q20 but off sharply from year-end level of 1.92%
- TIPS did well as inflation expectations rose from 1.34% to 1.63%.
- No rate hikes expected until at least 2023

Bloomberg Barclays Aggregate roughly flat

- Corporate and CMBS the strongest investment grade sectors as investors hunted for yield
- Corporate supply ($1 trillion YTD) at a record as companies rushed to take advantage of ultra-low interest rates

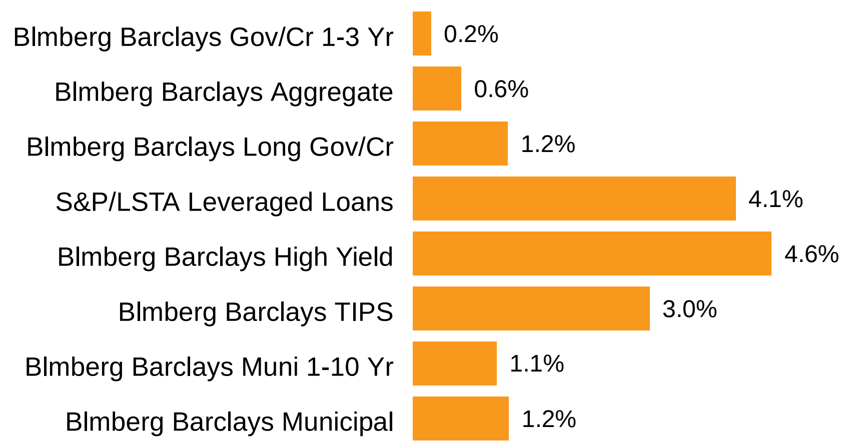
Risk-on sentiment helped high yield and loans

- Non-investment grade sectors rallied, but remain roughly flat YTD.
- The high yield bond market also experienced high levels of net new issuance (over $120 billion YTD).

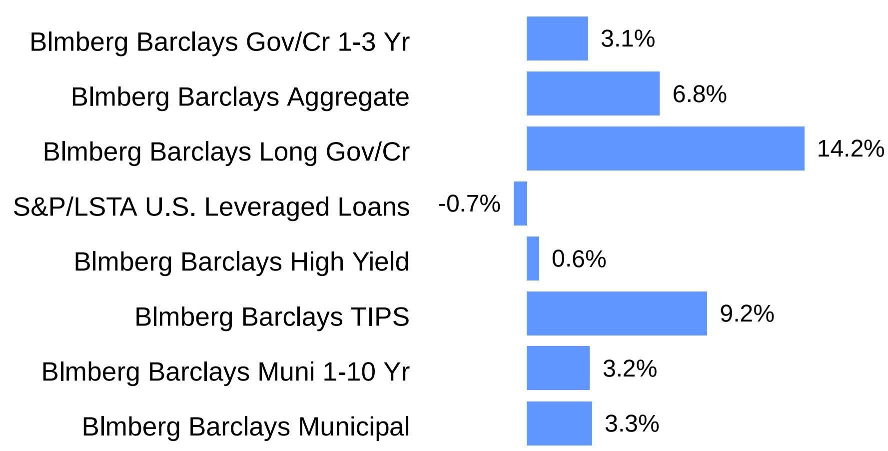
Munis boosted by favorable supply/demand dynamics

- Robust demand and muted supply of tax-exempt municipals
- Issuance in taxable municipals sharply higher
- Tax revenues better than expected, but challenges remain and stimulus uncertain (but needed)

U.S. Fixed Income: Quarterly Returns



U.S. Fixed Income: Nine Month Returns

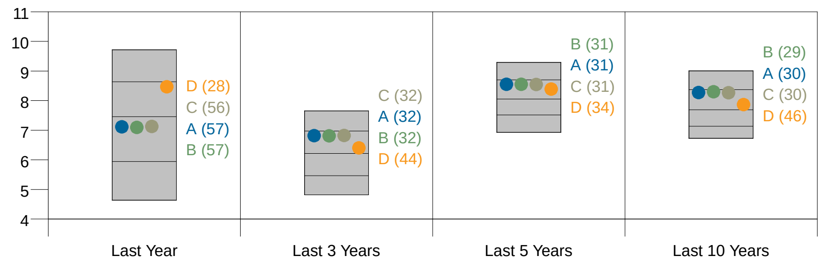


Callan

Pension Plan

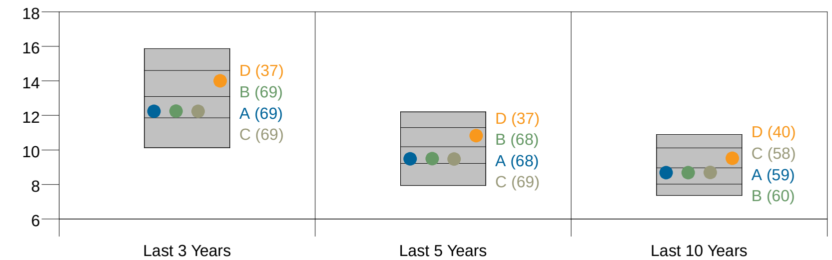
PERS, TRS, and JRS Performance Dashboard – September 30, 2020

Returns vs Callan Public Fund Sponsor Database



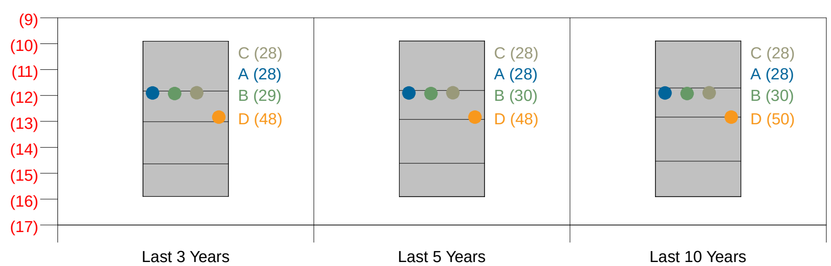
		Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		9.72	7.65	9.29	9.01
25th Percentile		8.64	6.97	8.70	8.37
Median		7.46	6.22	8.06	7.70
75th Percentile		5.95	5.47	7.52	7.14
90th Percentile		4.64	4.82	6.93	6.73
Member Count		232	231	229	209
Employees' Total Plan	A	7.12	6.82	8.55	8.28
Teachers' Total Plan	B	7.10	6.82	8.55	8.30
Judicial Total Plan	C	7.13	6.82	8.55	8.27
Policy Target	D	8.47	6.40	8.39	7.87

Standard Deviation vs Callan Public Fund Sponsor Database



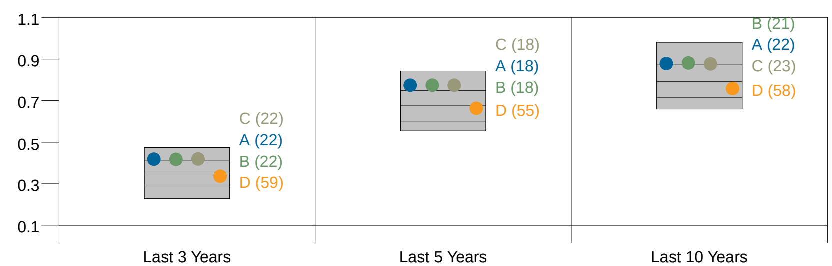
		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		15.87	12.21	10.90
25th Percentile		14.61	11.30	10.12
Median		13.09	10.20	8.97
75th Percentile		11.87	9.23	8.03
90th Percentile		10.14	7.95	7.37
Member Count		231	229	209
Employees' Total Plan	A	12.24	9.49	8.69
Teachers' Total Plan	B	12.26	9.50	8.69
Judicial Total Plan	C	12.24	9.48	8.70
Policy Target	D	14.01	10.83	9.52

Maximum Drawdown vs Callan Public Fund Sponsor Database



		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		(9.90)	(9.89)	(9.89)
25th Percentile		(11.82)	(11.80)	(11.70)
Median		(13.01)	(12.92)	(12.83)
75th Percentile		(14.64)	(14.61)	(14.53)
90th Percentile		(15.89)	(15.90)	(15.90)
Member Count		231	229	209
Employees' Total Plan	A	(11.90)	(11.90)	(11.90)
Teachers' Total Plan	B	(11.92)	(11.92)	(11.92)
Judicial Total Plan	C	(11.89)	(11.89)	(11.89)
Policy Target	D	(12.83)	(12.83)	(12.83)

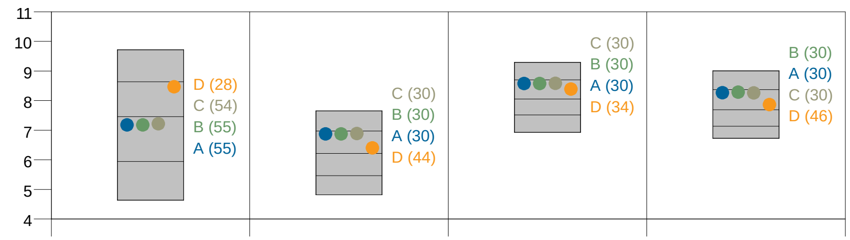
Sharpe Ratio vs Callan Public Fund Sponsor Database



		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		0.47	0.84	0.98
25th Percentile		0.41	0.75	0.87
Median		0.36	0.68	0.79
75th Percentile		0.29	0.60	0.72
90th Percentile		0.23	0.55	0.66
Member Count		231	229	209
Employees' Total Plan	A	0.42	0.78	0.88
Teachers' Total Plan	B	0.42	0.77	0.88
Judicial Total Plan	C	0.42	0.78	0.88
Policy Target	D	0.34	0.66	0.76

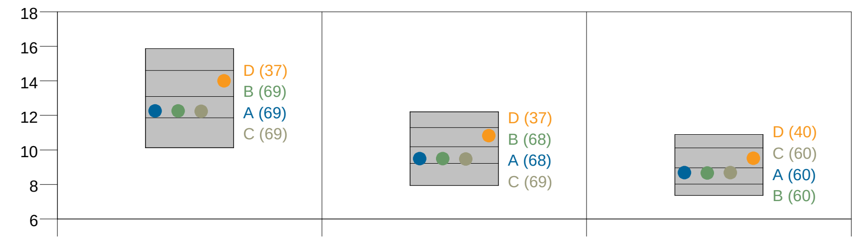
Health Care Plans Performance Dashboard – September 30, 2020

Returns vs Callan Public Fund Sponsor Database



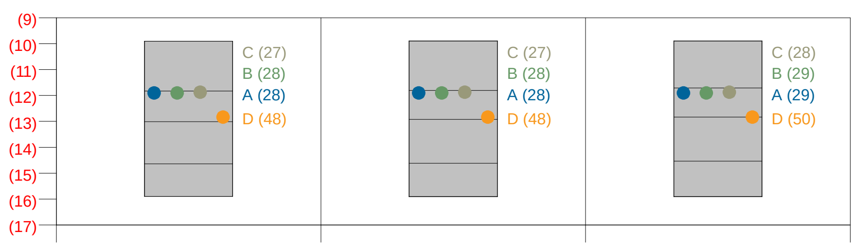
		Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		9.72	7.65	9.29	9.01
25th Percentile		8.64	6.97	8.70	8.37
Median		7.46	6.22	8.06	7.70
75th Percentile		5.95	5.47	7.52	7.14
90th Percentile		4.64	4.82	6.93	6.73
Member Count		232	231	229	209
PERS Health Plan	A	7.18	6.88	8.58	8.27
TRS Health Plan	B	7.18	6.88	8.58	8.29
JRS Health Plan	C	7.22	6.89	8.59	8.26
Policy Target	D	8.47	6.40	8.39	7.87

Standard Deviation vs Callan Public Fund Sponsor Database



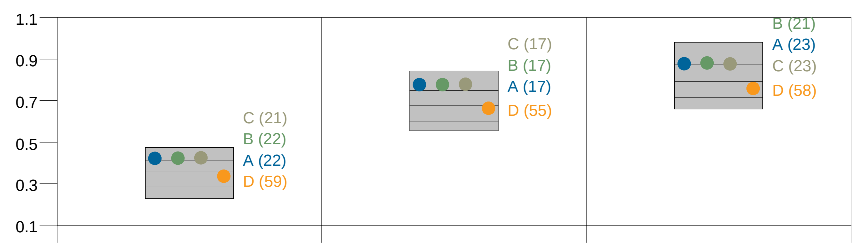
		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		15.87	12.21	10.90
25th Percentile		14.61	11.30	10.12
Median		13.09	10.20	8.97
75th Percentile		11.87	9.23	8.03
90th Percentile		10.14	7.95	7.37
Member Count		231	229	209
PERS Health Plan	A	12.27	9.50	8.69
TRS Health Plan	B	12.27	9.50	8.68
JRS Health Plan	C	12.24	9.48	8.69
Policy Target	D	14.01	10.83	9.52

Maximum Drawdown vs Callan Public Fund Sponsor Database



		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		(9.90)	(9.89)	(9.89)
25th Percentile		(11.82)	(11.80)	(11.70)
Median		(13.01)	(12.92)	(12.83)
75th Percentile		(14.64)	(14.61)	(14.53)
90th Percentile		(15.89)	(15.90)	(15.90)
Member Count		231	229	209
PERS Health Plan	A	(11.90)	(11.90)	(11.90)
TRS Health Plan	B	(11.90)	(11.90)	(11.90)
JRS Health Plan	C	(11.87)	(11.87)	(11.87)
Policy Target	D	(12.83)	(12.83)	(12.83)

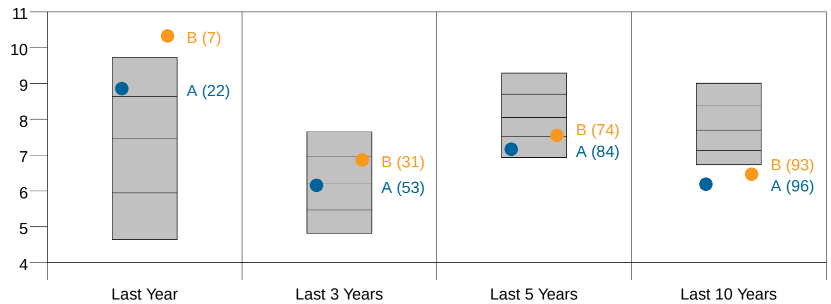
Sharpe Ratio vs Callan Public Fund Sponsor Database



		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		0.47	0.84	0.98
25th Percentile		0.41	0.75	0.87
Median		0.36	0.68	0.79
75th Percentile		0.29	0.60	0.72
90th Percentile		0.23	0.55	0.66
Member Count		231	229	209
PERS Health Plan	A	0.42	0.78	0.88
TRS Health Plan	B	0.42	0.78	0.88
JRS Health Plan	C	0.42	0.78	0.88
Policy Target	D	0.34	0.66	0.76

Military Plan Performance Dashboard – September 30, 2020

Returns vs Callan Public Fund Sponsor Database



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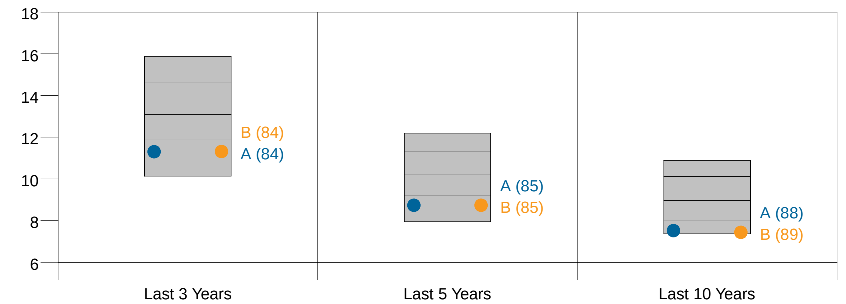
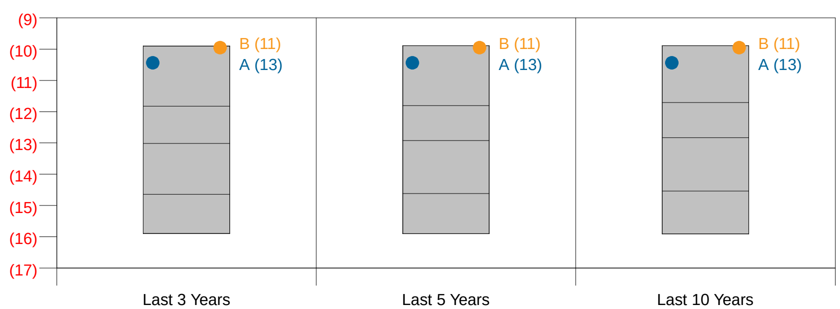
25th Percentile		8.64	6.97	8.70	8.37
Median		7.46	6.22	8.06	7.70
75th Percentile		5.95	5.47	7.52	7.14
90th Percentile		4.64	4.82	6.93	6.73
Member Count		232	231	229	209
Military Total Plan	● A	8.86	6.16	7.17	6.19
Military Policy Target	● B	10.33	6.86	7.55	6.47

Standard Deviation vs Callan Public Fund Sponsor Database



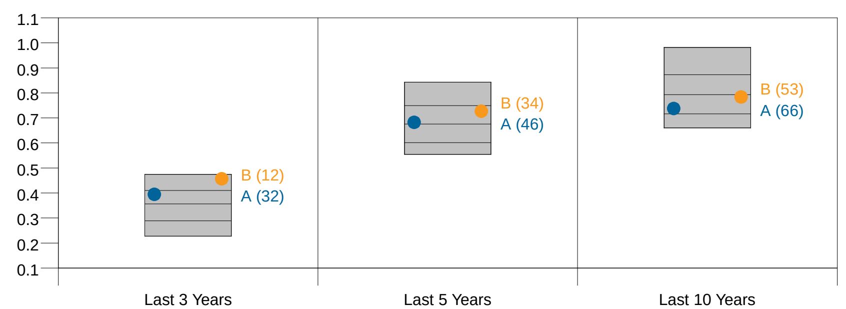
		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		15.87	12.21	10.90
25th Percentile		14.61	11.30	10.12
Median		13.09	10.20	8.97
75th Percentile		11.87	9.23	8.03
90th Percentile		10.14	7.95	7.37
Member Count		231	229	209
Military Total Plan	● A	11.31	8.74	7.52
Military Policy Target	● B	11.32	8.74	7.44

Maximum Drawdown vs Callan Public Fund Sponsor Database



		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		(9.90)	(9.89)	(9.89)
25th Percentile		(11.82)	(11.80)	(11.70)
Median		(13.01)	(12.92)	(12.83)
75th Percentile		(14.64)	(14.61)	(14.53)
90th Percentile		(15.89)	(15.90)	(15.90)
Member Count		231	229	209
Military Total Plan	● A	(10.44)	(10.44)	(10.44)
Military Policy Target	● B	(9.95)	(9.95)	(9.95)

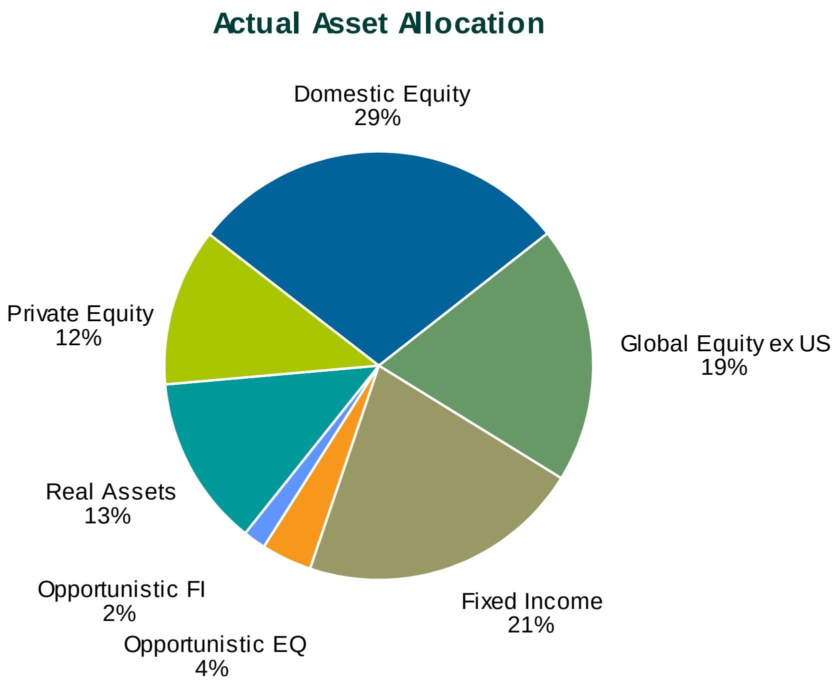
Sharpe Ratio vs Callan Public Fund Sponsor Database

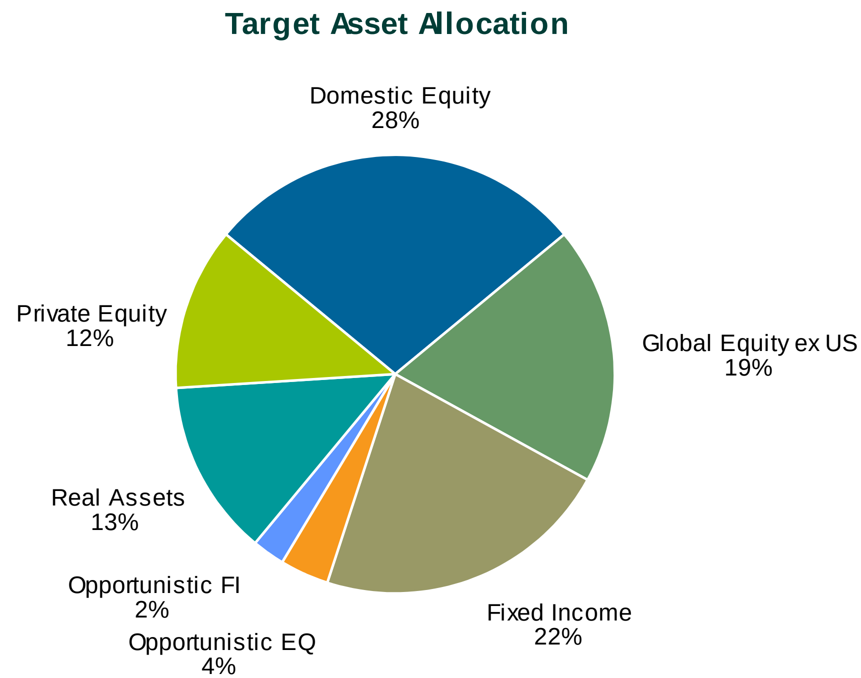


		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		0.47	0.84	0.98
25th Percentile		0.41	0.75	0.87
Median		0.36	0.68	0.79
75th Percentile		0.29	0.60	0.72
90th Percentile		0.23	0.55	0.66
Member Count		231	229	209
Military Total Plan	● A	0.39	0.68	0.74
Military Policy Target	● B	0.46	0.73	0.78

Asset Allocation – Public Employees' Retirement System

Quarter Ending September 30, 2020





Asset Class	$000s Actual	Weight Actual	Target	Percent Difference	$000s Difference
Domestic Equity	2,868,337	28.9%	28.0%	0.9%	90,430
Global Equity ex US	1,922,461	19.4%	19.0%	0.4%	37,452
Fixed Income	2,127,372	21.4%	22.0%	(0.6%)	(55,270)
Opportunistic EQ	375,576	3.8%	3.6%	0.2%	18,416
Opportunistic FI	168,393	1.7%	2.4%	(0.7%)	(69,713)
Real Assets	1,275,958	12.9%	13.0%	(0.1%)	(13,785)
Private Equity	1,183,002	11.9%	12.0%	(0.1%)	(7,530)
Total	9,921,099	100.0%	100.0%		

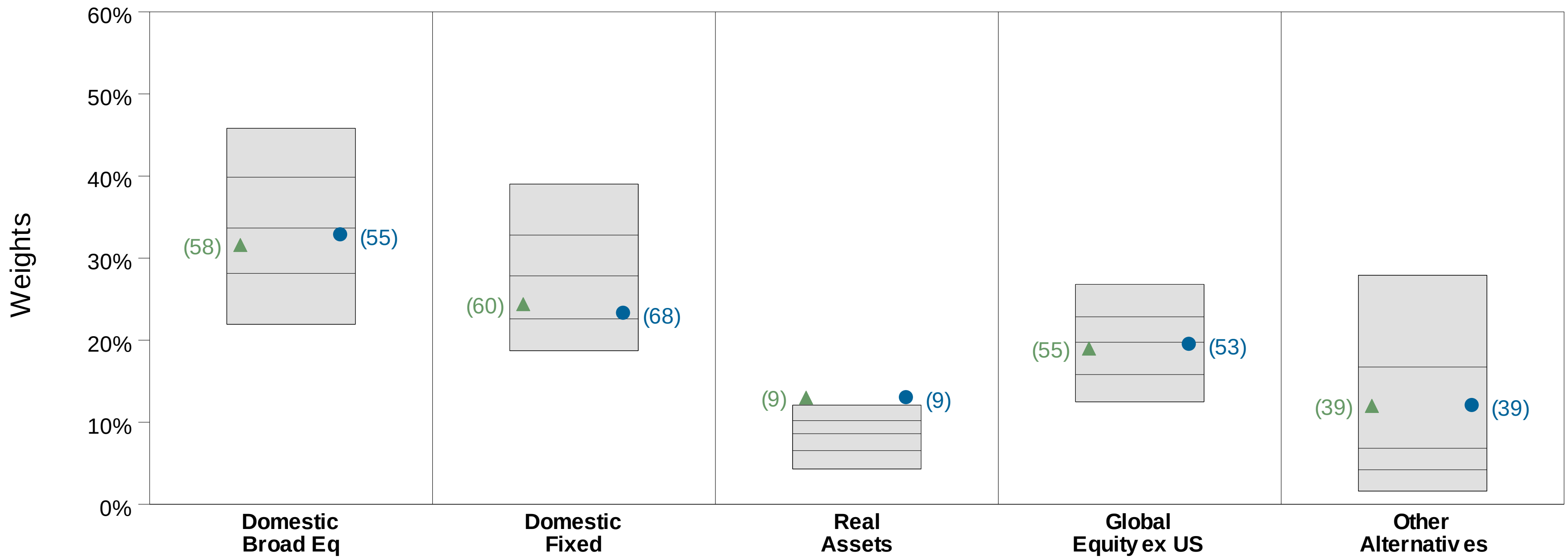
PERS is used as illustrative throughout the presentation.

The other plans exhibit similar modest and understandable variations from strategic target allocations.

Asset Allocation vs. Public Funds (PERS)

Callan Public Fund Database

Asset Class Weights vs Callan Public Fund Sponsor Database



	Domestic Broad Eq	Domestic Fixed	Real Assets	Global Equity ex US	Other Alternativ es
10th Percentile	45.82	39.03	12.09	26.80	27.92
25th Percentile	39.85	32.81	10.20	22.85	16.73
Median	33.67	27.84	8.61	19.75	6.84
75th Percentile	28.14	22.59	6.55	15.82	4.21
90th Percentile	21.93	18.73	4.30	12.50	1.61
Fund ●	32.70	23.14	12.86	19.38	11.92
Target ▲	31.60	24.40	13.00	19.00	12.00

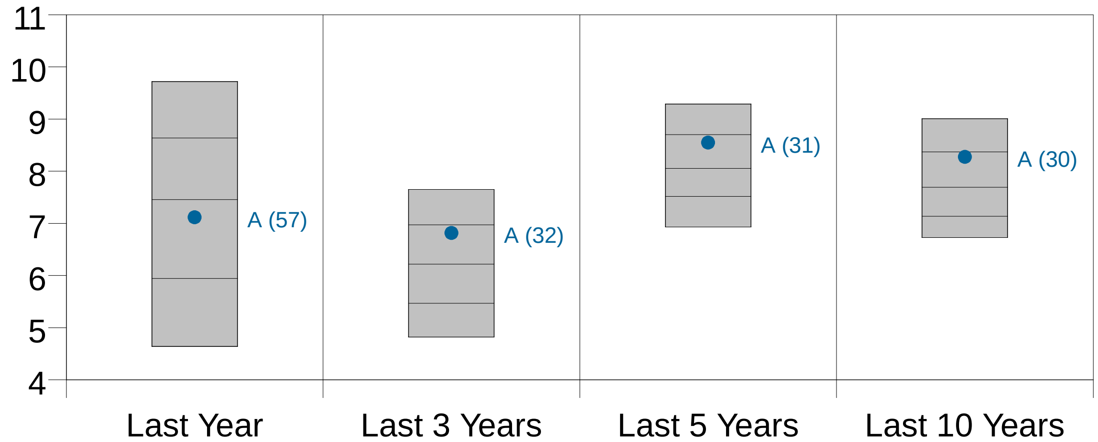
- Asset class allocations are in line with targets after the recent asset allocation update and associated rebalancing.
- Weightings to real assets and alternatives are relatively high in comparison to other public funds.

Notes: Real Assets includes Private Real Estate, REITs, Farmland, Timber, Energy, and Infrastructure. Other Alternatives represents private equity.

Total Fund Return vs Public Funds (PERS)

Callan Public Fund Database

Gross of Fee Returns
for Periods Ended September 30, 2020
Group: Callan Public Fund Sponsor Database



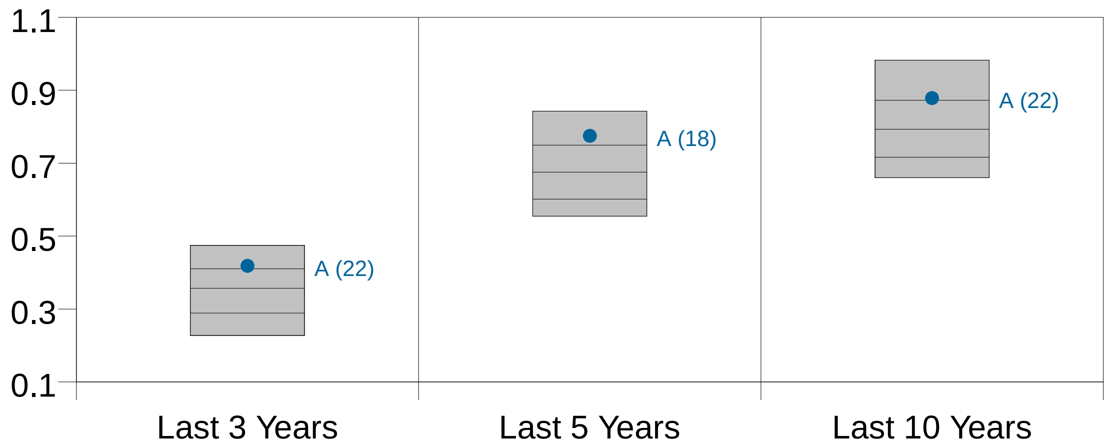
	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	9.72	7.65	9.29	9.01
25th Percentile	8.64	6.97	8.70	8.37
Median	7.46	6.22	8.06	7.70
75th Percentile	5.95	5.47	7.52	7.14
90th Percentile	4.64	4.82	6.93	6.73
Member Count	232	231	229	209
PERS - Total Fund ● A	7.12	6.82	8.55	8.28

- Despite the recent change to the asset allocation, longer-term performance reflects ARMB’s prior orientation toward capital growth as opposed to income generation.
- Recent performance is below median but medium and longer term performance is above median.

Total Fund Sharpe Ratio Rankings vs Public Funds (PERS)

Callan Public Fund Database

Gross of Fee Sharpe Ratio
for Periods Ended September 30, 2020
Group: Callan Public Fund Sponsor Database



	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	0.47	0.84	0.98
25th Percentile	0.41	0.75	0.87
Median	0.36	0.68	0.79
75th Percentile	0.29	0.60	0.72
90th Percentile	0.23	0.55	0.66
Member Count	231	229	209
PERS - Total Fund ● A	0.42	0.78	0.88

- "Sharpe ratio" is a risk-adjusted measure of excess return above the risk-free rate.
- ARMB's risk-adjusted return (Sharpe ratio) was above the Public Funds median for the three-, five-, and 10-year periods.

Total Maximum Drawdown Rankings vs Public Funds (PERS)

Callan Public Fund Database

Gross of Fee Maximum Drawdown
for Periods Ended September 30, 2020
Group: Callan Public Fund Sponsor Database

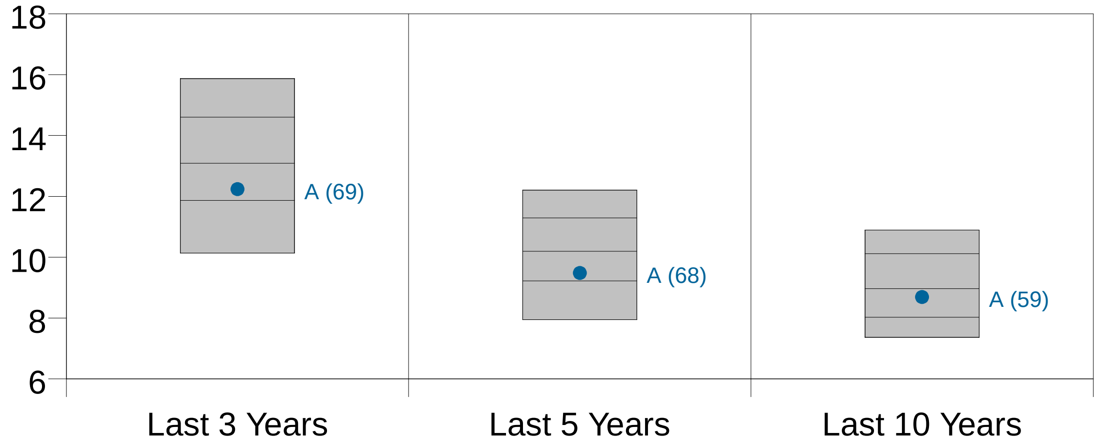
	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	(9.82)	(9.90)	(9.89)	(9.89)
25th Percentile	(11.82)	(11.82)	(11.80)	(11.70)
Median	(13.06)	(13.01)	(12.92)	(12.83)
75th Percentile	(14.62)	(14.64)	(14.61)	(14.53)
90th Percentile	(15.89)	(15.89)	(15.90)	(15.90)
Member Count	232	231	229	209
PERS - Total Fund ● A	(11.90)	(11.90)	(11.90)	(11.90)

- “Maximum drawdown” is a measure of the largest loss from peak to trough in a given period.
- Lower rankings reflect larger drawdowns (i.e. bigger losses). ARMB’s drawdown rankings for all periods have reflected better than average drawdowns (i.e. lower losses) and have improved over time.
- The drawdown experienced in the first quarter of 2020 is the largest of the last 10 years.

Standard Deviation Ranking vs Public Funds (PERS)

Callan Public Fund Database

Gross of Fee Standard Deviation
for Periods Ended September 30, 2020
Group: Callan Public Fund Sponsor Database

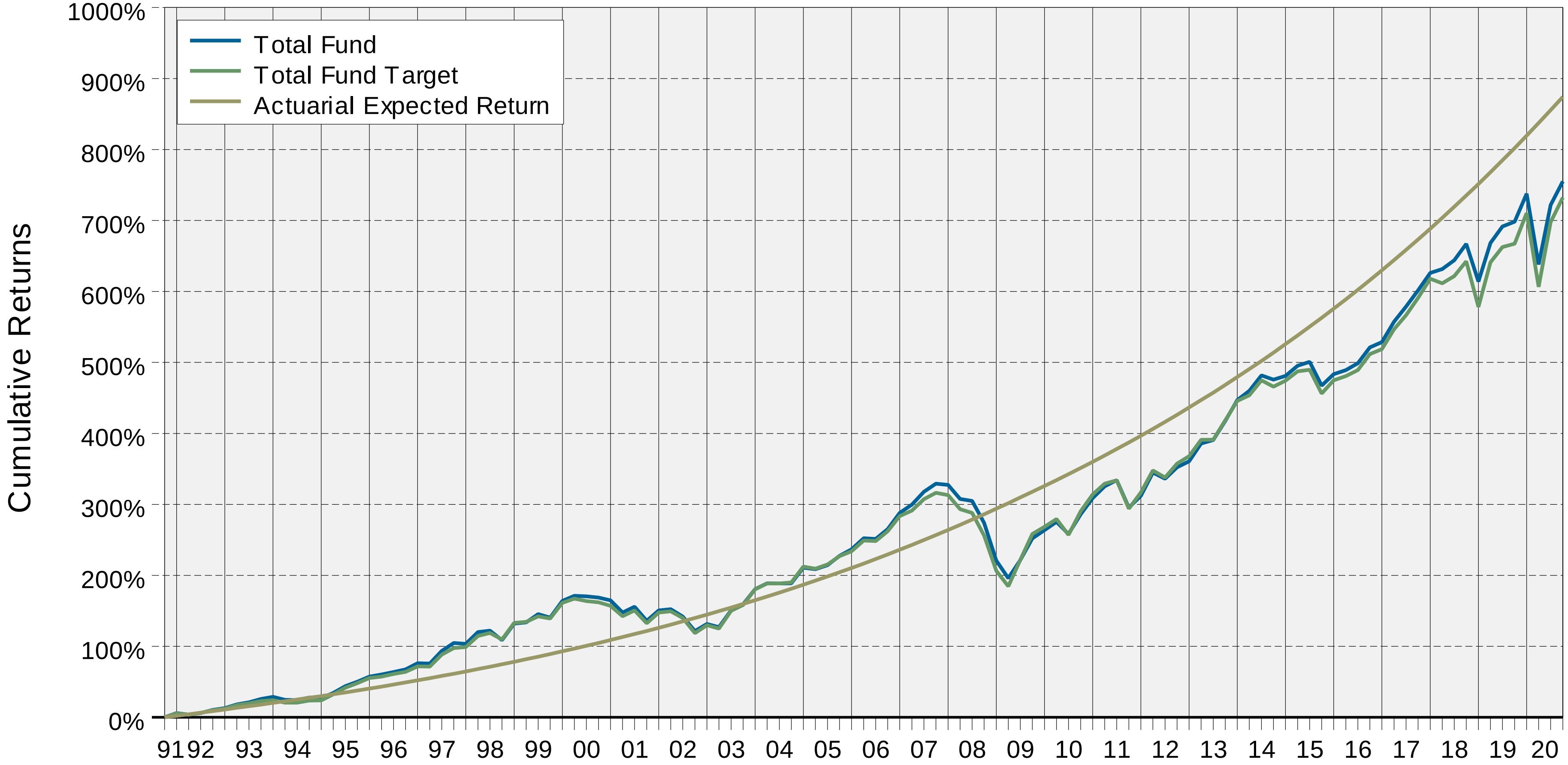


	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	15.87	12.21	10.90
25th Percentile	14.61	11.30	10.12
Median	13.09	10.20	8.97
75th Percentile	11.87	9.23	8.03
90th Percentile	10.14	7.95	7.37
Member Count	231	229	209
PERS - Total Fund ● A	12.24	9.49	8.69

- “Standard deviation” measures variability of returns. It is one measurement of investment risk.
- Less standard deviation results in lower rankings. A lower ranking of standard deviation suggests lower variability.
- ARMB’s portfolio diversification has resulted in volatility that is lower than median compared to peers.

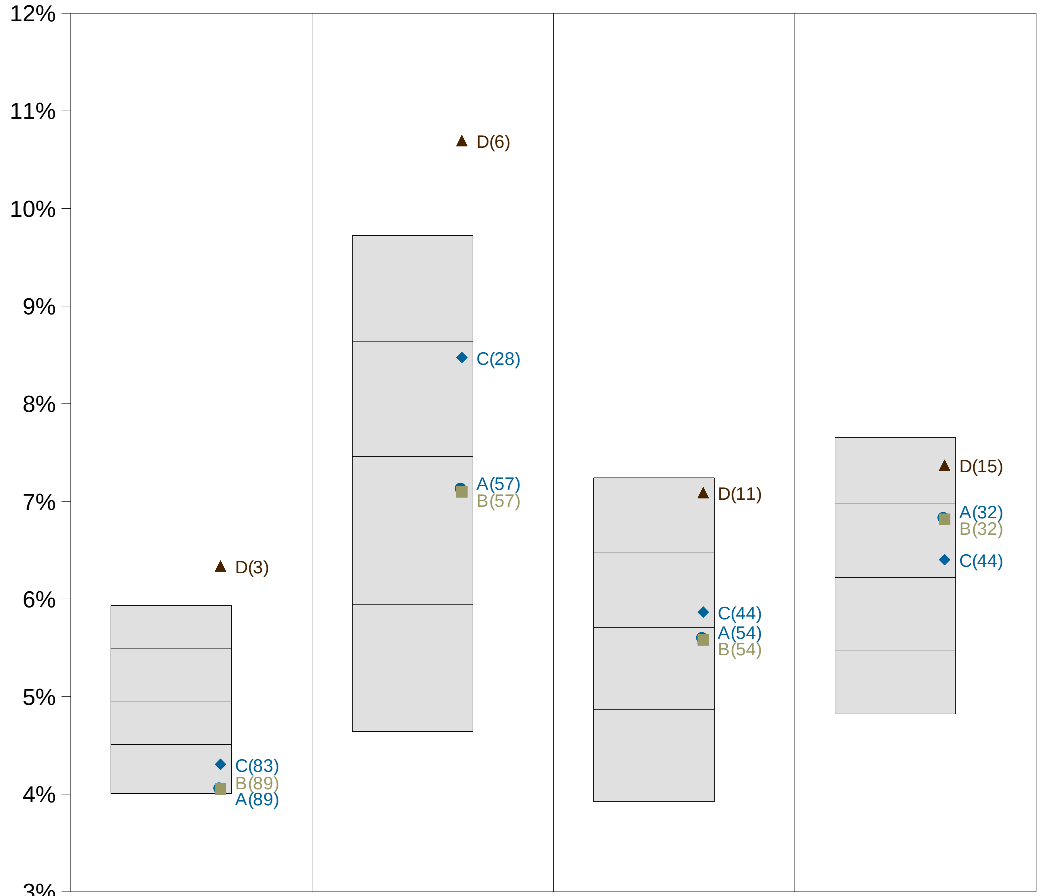
PERS Long-Term Total Fund Performance as of 9/30/20

Cumulative Returns Actual vs Target



- Each Fund has two targets: the asset allocation policy return and the actuarial return.
- Total Fund returns continue to closely track the strategic allocation target.
- Market correction setbacks in 3Q15, 4Q18, and 1Q20 have hindered the Total Fund's progress toward closing the gap versus the actuarial return following the Global Financial Crisis of 2008/2009.

Annualized Total Fund Returns as of 9/30/20

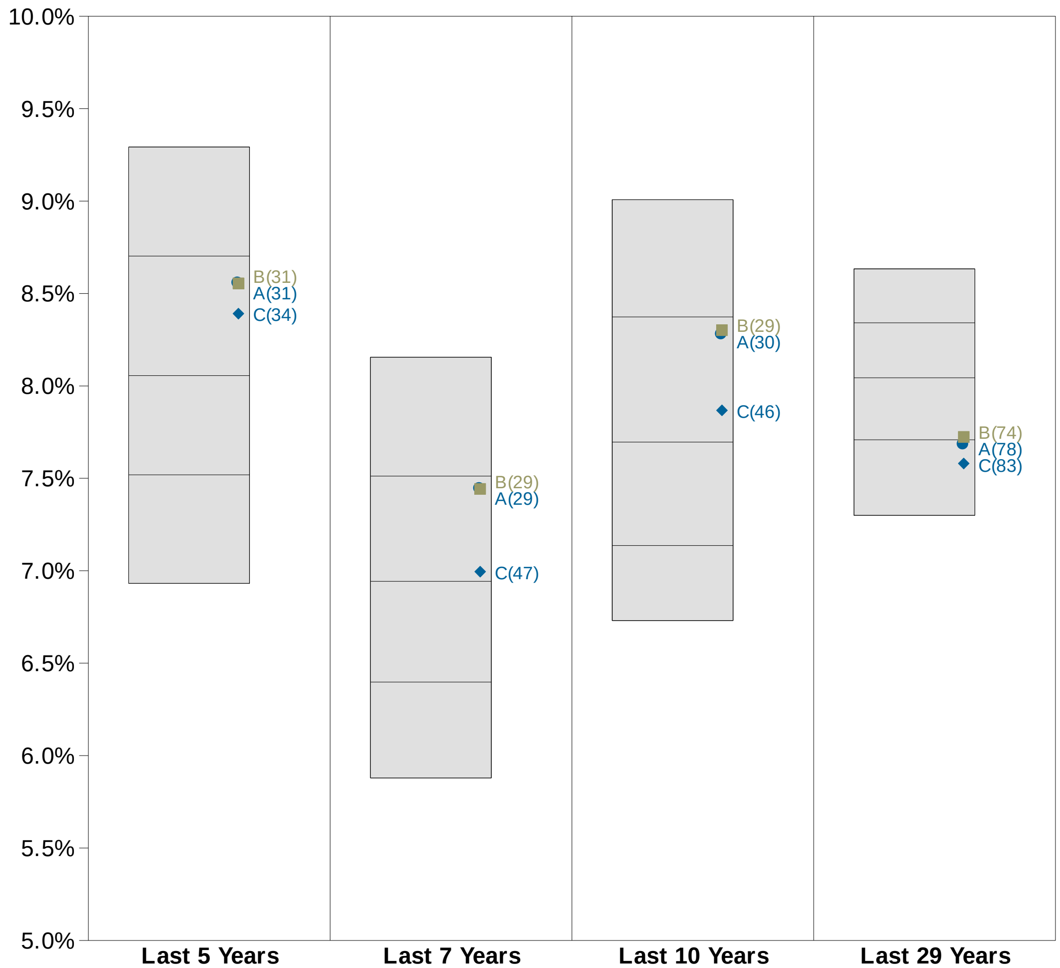


		Last Quarter	Last Year	Last 2 Years	Last 3 Years
10th Percentile		5.93	9.72	7.24	7.65
25th Percentile		5.49	8.64	6.47	6.97
Median		4.95	7.46	5.71	6.22
75th Percentile		4.51	5.95	4.87	5.47
90th Percentile		4.01	4.64	3.92	4.82
PERS Total Plan	● A	4.05	7.12	5.59	6.82
TRS Total Plan	■ B	4.05	7.10	5.58	6.82
Target Index	◆ C	4.31	8.47	5.87	6.40
Public Market Proxy	▲ D	6.34	10.70	7.09	7.37

- PERS and TRS have underperformed their target for the last quarter, one-year, and two-year periods, but outperformed over the three-year period.
- Current quarter underperformance was driven by the manager effect within domestic equity.

The Public Market Proxy consists of 45% Russell 3000 Index, 30% MSCI ACWI ex US IMI (Net), and 25% Bloomberg Aggregate Index.

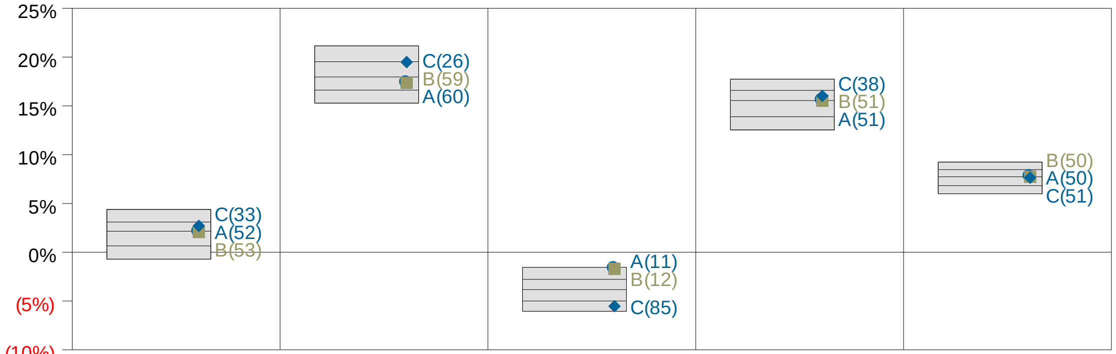
Longer-Term Total Fund Returns as of 9/30/20



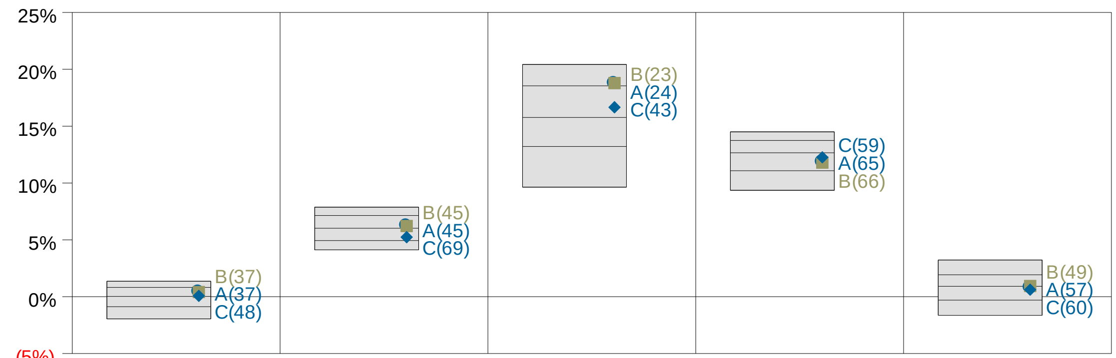
	Last 5 Years	Last 7 Years	Last 10 Years	Last 29 Years
10th Percentile	9.29	8.15	9.01	8.63
25th Percentile	8.70	7.51	8.37	8.34
Median	8.06	6.94	7.70	8.04
75th Percentile	7.52	6.40	7.14	7.71
90th Percentile	6.93	5.88	6.73	7.30
PERS Total Plan ● A	8.55	7.44	8.28	7.68
TRS Total Plan ■ B	8.55	7.44	8.30	7.72
Target Index ◆ C	8.39	7.00	7.87	7.58

- Five-, seven-, and ten-year performance is above target and median.
- 29 year return for PERS beats the target by 10 basis points.

Calendar Period Total Fund Performance



		12/2019- 9/2020	2019	2018	2017	2016
10th Percentile		4.39	21.15	(1.53)	17.73	9.24
25th Percentile		3.10	19.53	(2.77)	16.59	8.46
Median		2.15	17.96	(3.82)	15.55	7.73
75th Percentile		0.65	16.61	(4.99)	13.88	6.82
90th Percentile		(0.72)	15.27	(6.05)	12.53	5.98
PERS Total Plan	● A	2.09	17.34	(1.70)	15.52	7.74
TRS Total Plan	■ B	2.07	17.36	(1.70)	15.54	7.74
Target Index	◆ C	2.70	19.49	(5.53)	16.03	7.64

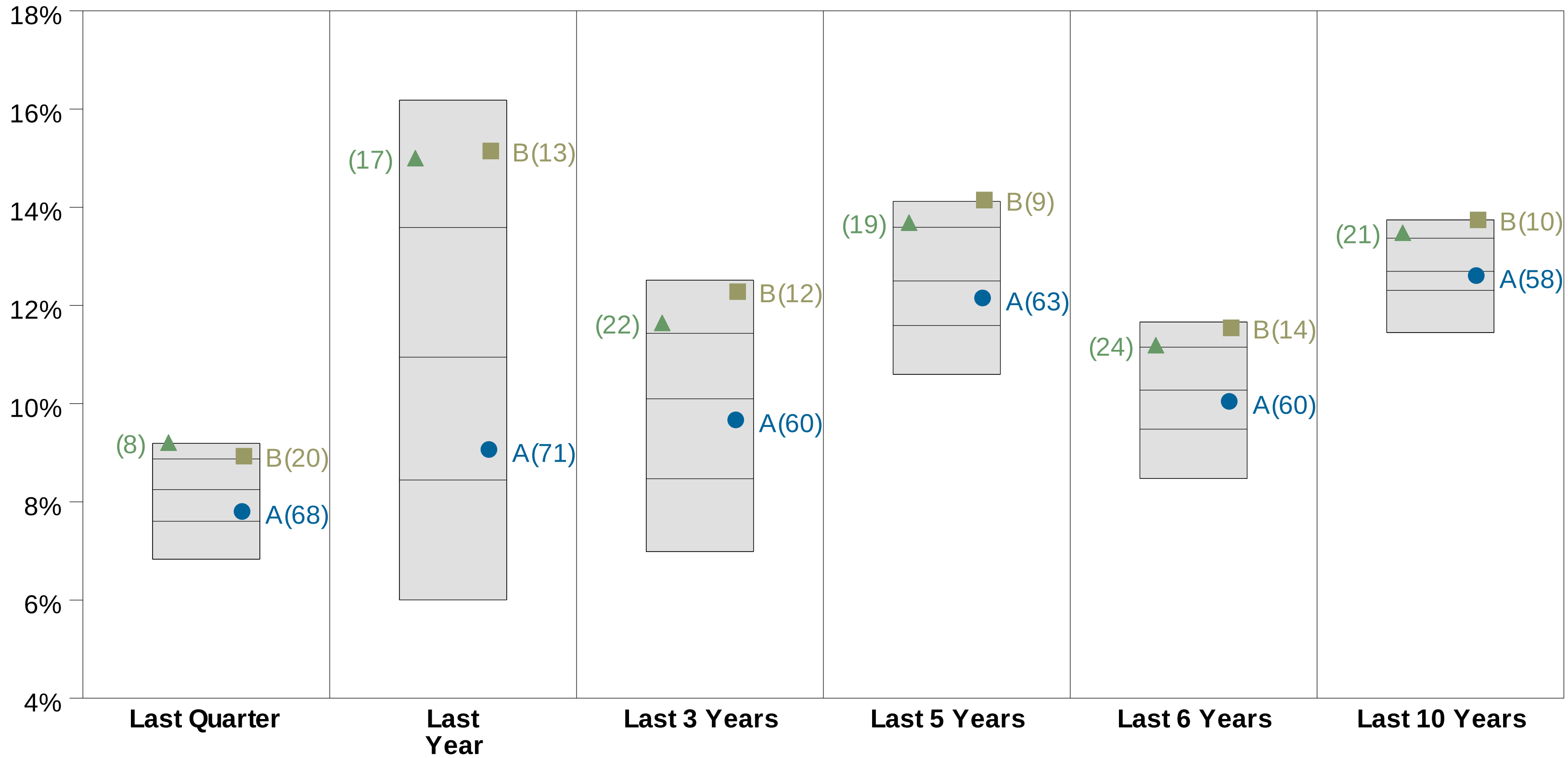


		2015	2014	2013	2012	2011
10th Percentile		1.36	7.88	20.42	14.50	3.22
25th Percentile		0.83	7.14	18.55	13.74	1.92
Median		0.03	6.03	15.77	12.65	0.91
75th Percentile		(0.87)	4.94	13.21	11.08	(0.30)
90th Percentile		(1.95)	4.12	9.63	9.36	(1.63)
PERS Total Plan	● A	0.40	6.22	18.74	11.81	0.77
TRS Total Plan	■ B	0.41	6.22	18.79	11.79	0.95
Target Index	◆ C	0.08	5.24	16.66	12.26	0.62

- PERS ranks above median in four and TRS ranks above median in five of the 10 periods shown.
- Peer group range of returns during 2016, 2015, and 2014 were very tight.
- Wide range of peer group returns during calendar 2013 due to varying fixed-income allocations within the Public Fund universe.

Total Domestic Equity through 9/30/20

Performance vs Public Fund - Domestic Equity (Gross)



	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	9.19	16.18	12.51	14.12	11.66	13.74
25th Percentile	8.87	13.59	11.43	13.59	11.15	13.37
Median	8.25	10.95	10.10	12.50	10.28	12.69
75th Percentile	7.60	8.44	8.47	11.59	9.48	12.31
90th Percentile	6.83	6.00	6.98	10.59	8.47	11.45
Domestic Equity Pool ● A	7.77	9.03	9.64	12.12	10.01	12.57
Standard & Poor's 500 ■ B	8.93	15.15	12.28	14.15	11.54	13.74
Russell 3000 Index ▲	9.21	15.00	11.65	13.69	11.19	13.48

Domestic Equity Component Returns

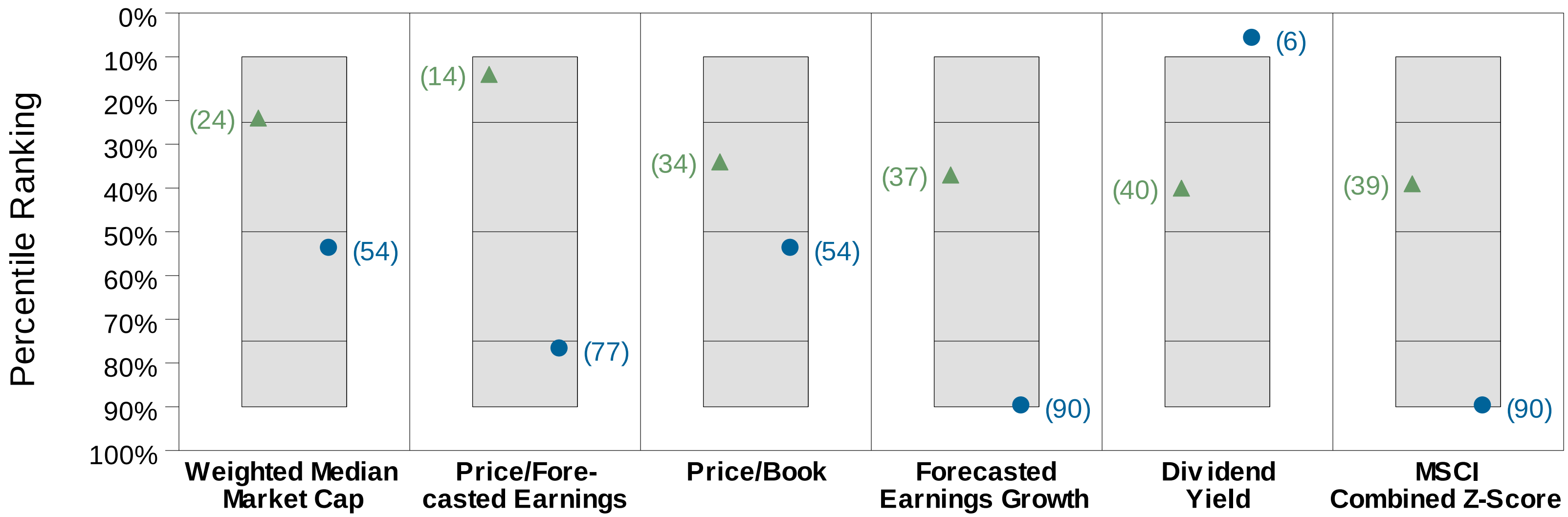
Returns for Periods Ended September 30, 2020

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Total Dom Equity Pool	7.77%	9.03%	9.64%	12.12%	12.57%
Russell 3000 Index	9.21%	15.00%	11.65%	13.69%	13.48%
Large Cap Managers	8.16%	10.74%	10.70%	12.82%	13.08%
Russell 1000 Index	9.47%	16.01%	12.38%	14.09%	13.76%
Small Cap Managers	3.16%	(8.35%)	0.62%	6.92%	9.90%
Russell 2000 Index	4.93%	0.39%	1.77%	8.00%	9.85%

- The large cap composite trailed its benchmark (the Russell 1000 Index) over all periods shown in the table.
- The small cap composite has also trailed its benchmark (the Russell 2000 Index) over most of the periods shown, the exception being outperformance over the trailing 10-year period.

Domestic Equity Portfolio Characteristics

Portfolio Characteristics Percentile Rankings
Rankings Against Public Fund - Domestic Equity
as of September 30, 2020

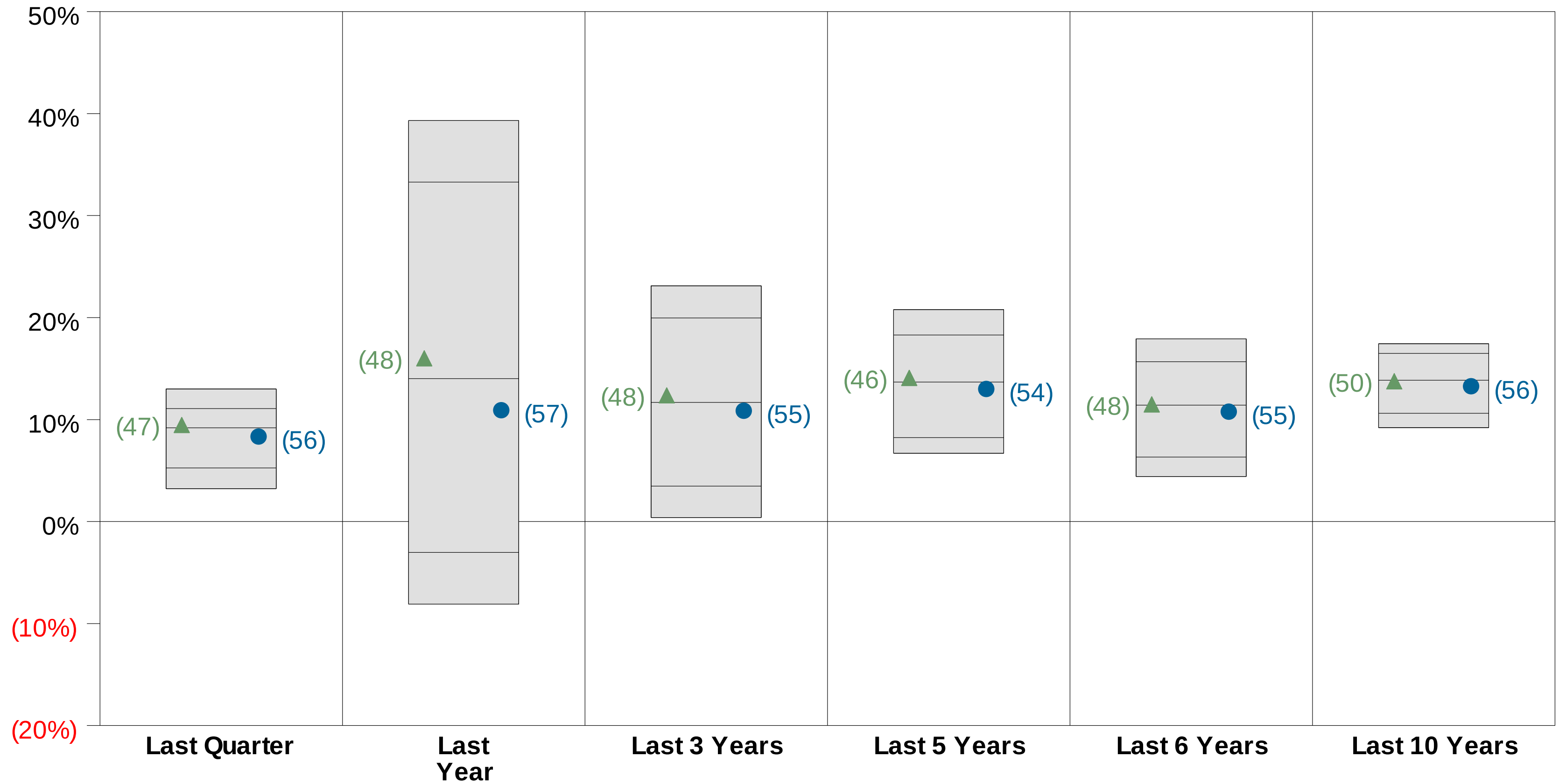


	Weighted Median Market Cap	Price/Fore-casted Earnings	Price/Book	Forecasted Earnings Growth	Dividend Yield	MSCI Combined Z-Score
10th Percentile	153.20	23.47	3.53	13.13	1.69	0.16
25th Percentile	109.45	22.35	3.45	12.45	1.65	0.07
Median	76.09	21.67	3.09	11.32	1.53	(0.00)
75th Percentile	57.55	21.05	2.85	10.86	1.39	(0.04)
90th Percentile	31.98	20.08	2.44	10.47	1.27	(0.15)
Domestic Equity Pool ●	70.98	20.95	3.04	10.45	1.70	(0.15)
Russell 3000 Index ▲	112.32	22.95	3.30	11.54	1.58	0.02

- ARMB's overall domestic equity portfolio's market capitalization is smaller than 54% of public funds (first column).
- Overall, ARMB's domestic equity portfolio tilts decidedly "value" versus peers (last column on right).
  - "MSCI Combined Z-Score" measures Growth and Value characteristics of individual stocks within managers' portfolios.
  - A low Z-Score rank (i.e.– the dot appears towards the top of the floating bar) indicates a Growth bias.
  - A high Z-Score rank (i.e. – the dot appears towards the bottom of the floating bar) indicates a Value bias.

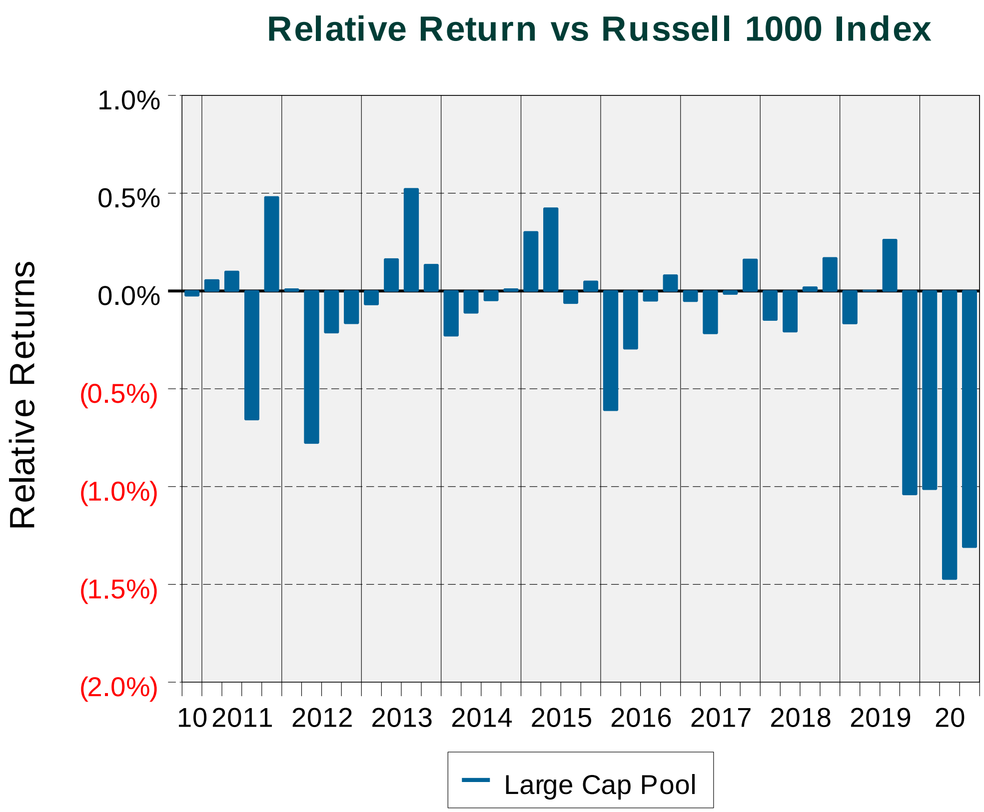
Large Cap Domestic Equity through 9/30/20

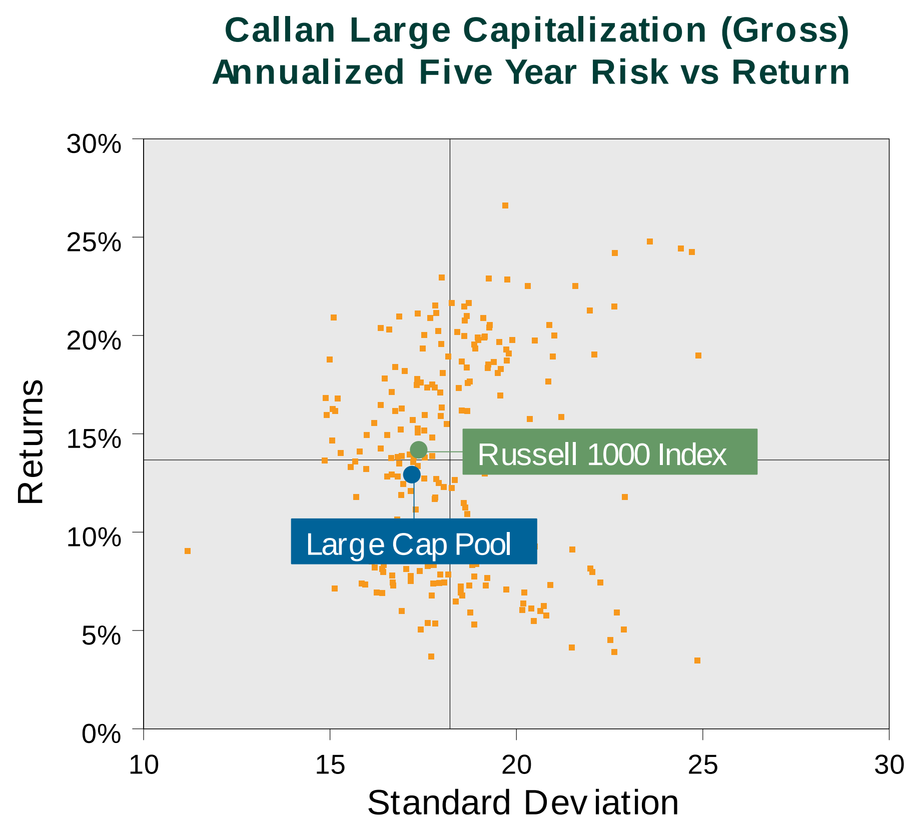
Performance vs Callan Large Capitalization (Gross)



	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	13.00	39.33	23.11	20.78	17.92	17.44
25th Percentile	11.08	33.29	19.97	18.28	15.67	16.49
Median	9.20	14.01	11.68	13.67	11.42	13.86
75th Percentile	5.26	(3.02)	3.47	8.23	6.32	10.61
90th Percentile	3.22	(8.09)	0.39	6.71	4.42	9.21
Large Cap Pool ●	8.16	10.74	10.70	12.82	10.58	13.08
Russell 1000 Index ▲	9.47	16.01	12.38	14.09	11.50	13.76

Large Cap Domestic Equity as of 9/30/20

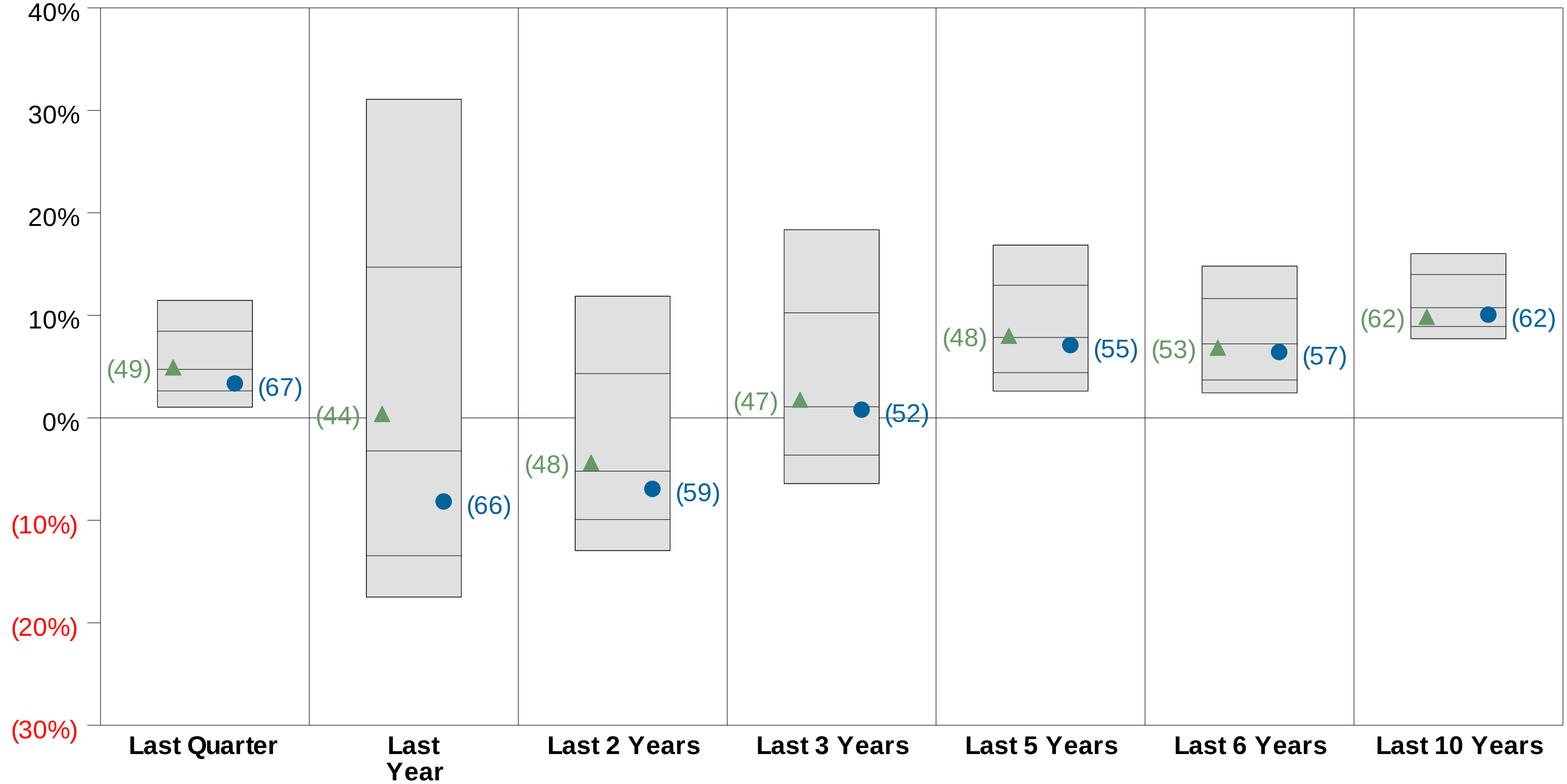




- Long-term performance exhibits market-like returns with similar risk.
- In the last four quarters, underperformance vs. the Russell 1000 Index was driven by Scientific Beta, which trailed the broad benchmark by between 2% and 4% in each of those quarters.
- In the last two quarters, passive implementation also detracted as the S&P 900 Index trailed the Russell 1000 Index by 1.1% in 2Q20 and 0.8% in 3Q20.

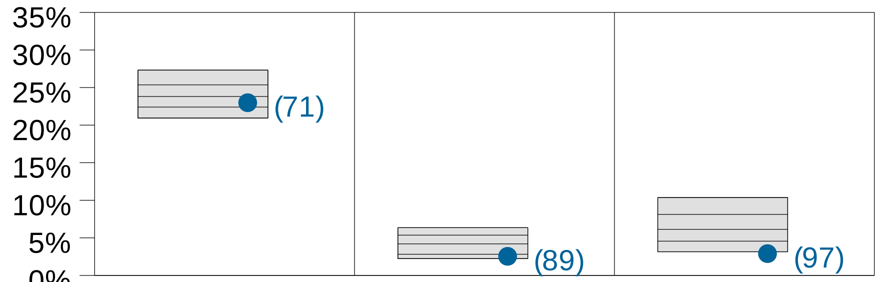
Small Cap Domestic Equity through 9/30/20

Performance vs Callan Small Capitalization (Gross)



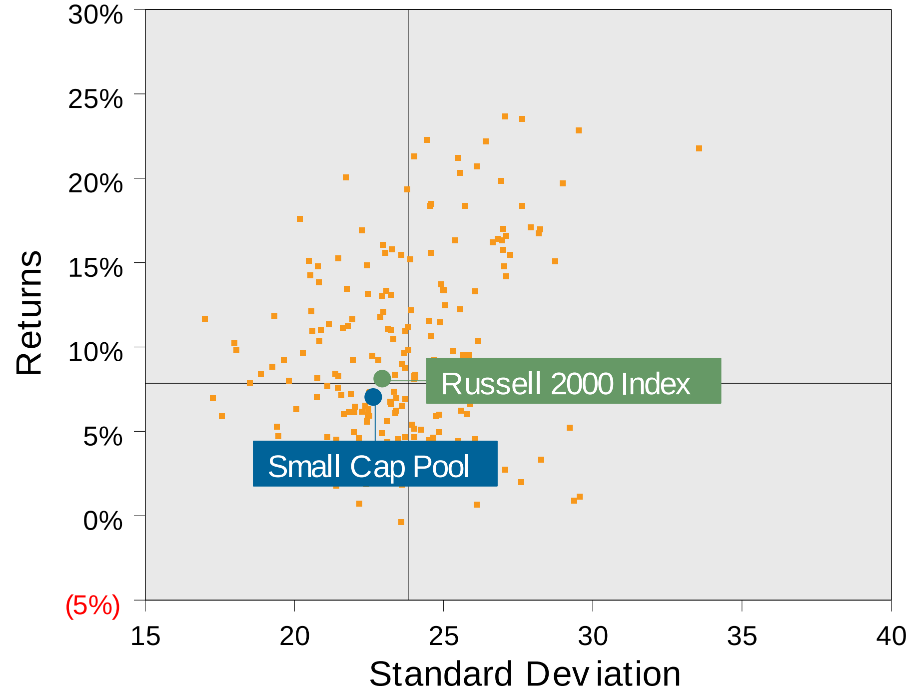
	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	11.47	31.09	11.88	18.34	16.86	14.82	16.01
25th Percentile	8.45	14.70	4.32	10.25	12.93	11.64	14.00
Median	4.73	(3.24)	(5.21)	1.07	7.85	7.22	10.75
75th Percentile	2.64	(13.45)	(9.93)	(3.63)	4.41	3.70	8.92
90th Percentile	1.05	(17.49)	(12.95)	(6.41)	2.61	2.43	7.73
Small Cap Pool ●	3.16	(8.35)	(7.11)	0.62	6.92	6.24	9.90
Russell 2000 Index ▲	4.93	0.39	(4.36)	1.77	8.00	6.85	9.85

Small Cap Domestic Equity through 9/30/20



	Standard Deviation	Downside Risk	Tracking Error
10th Percentile	27.34	6.37	10.37
25th Percentile	25.38	5.36	8.12
Median	23.81	4.22	6.15
75th Percentile	22.40	2.82	4.57
90th Percentile	20.95	2.26	3.16
Small Cap Equity Pool ●	22.71	2.28	2.64

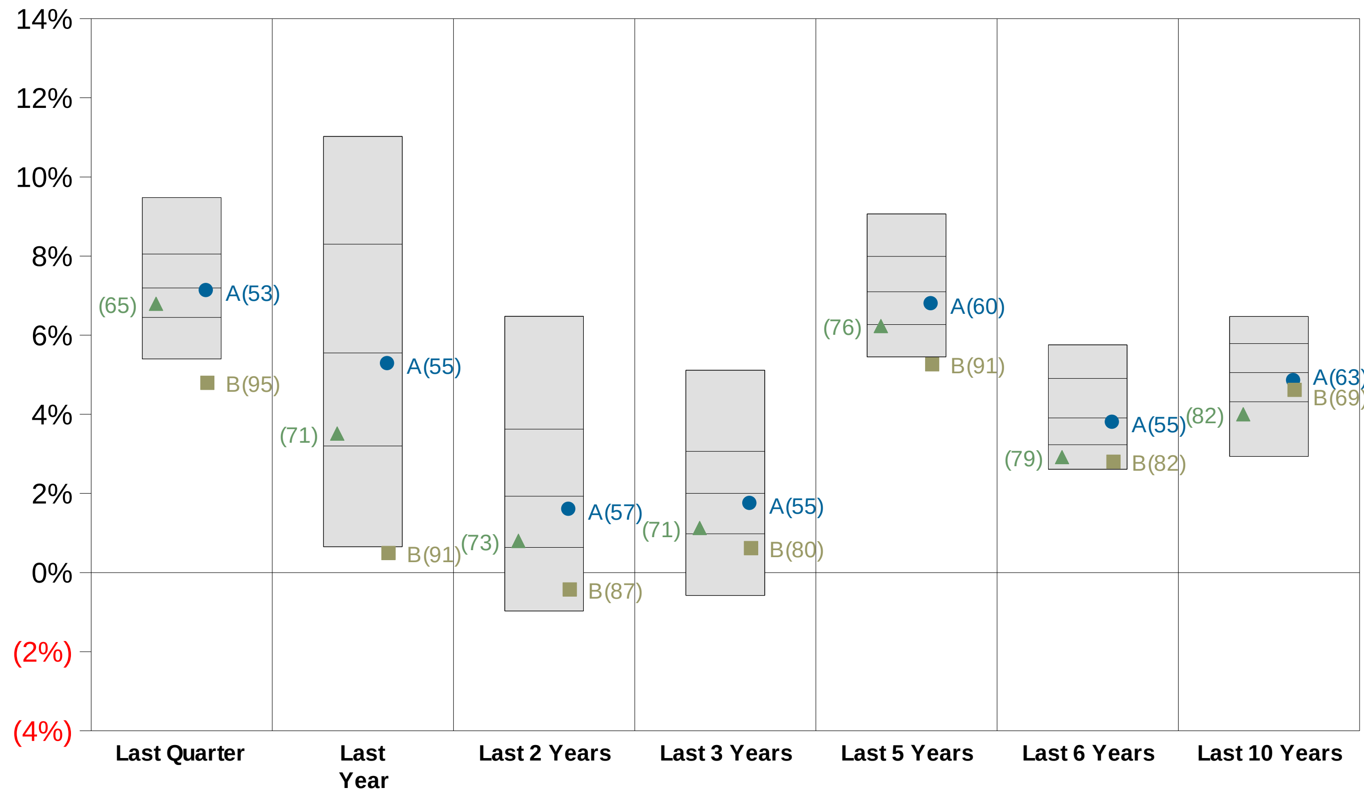
Callan Small Capitalization (Gross)
Annualized Five Year Risk vs Return



- The five-year risk statistics of standard deviation, downside risk, and tracking error compare favorably versus the peer group of small cap managers.

Global Equity ex-US through 9/30/20

Performance vs Public Fund - International Equity (Gross)

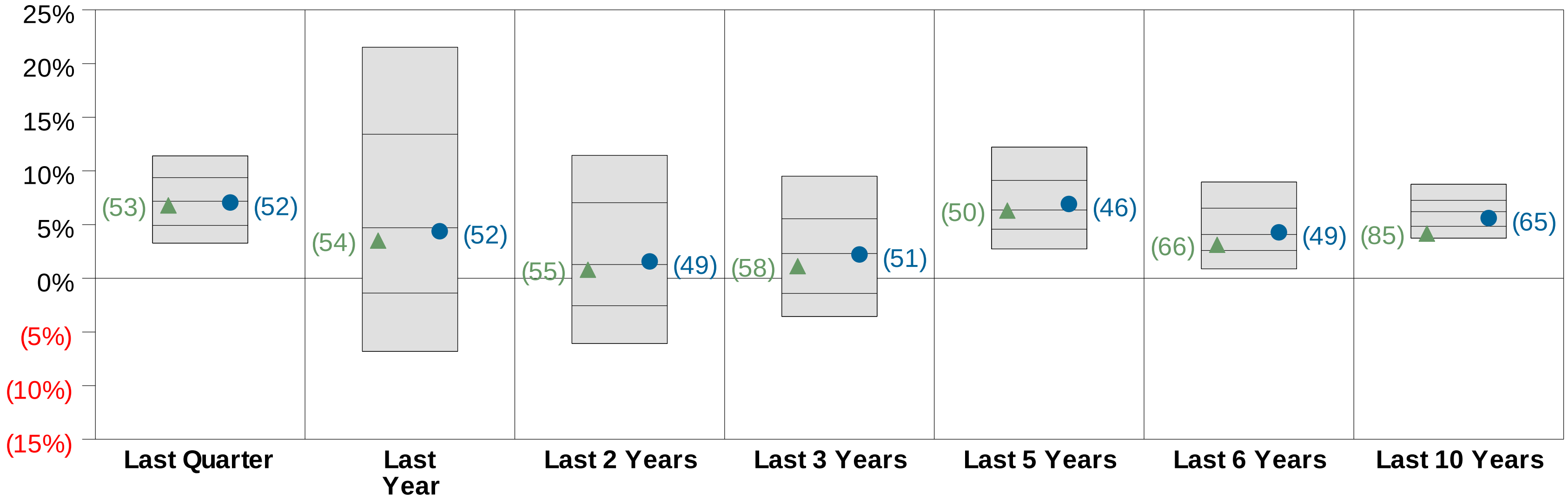


	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	9.48	11.02	6.48	5.11	9.06	5.76	6.47
25th Percentile	8.05	8.30	3.62	3.06	7.99	4.91	5.79
Median	7.19	5.55	1.93	2.00	7.10	3.91	5.06
75th Percentile	6.45	3.20	0.64	0.98	6.27	3.23	4.32
90th Percentile	5.40	0.65	(0.97)	(0.58)	5.45	2.61	2.94
Global Equity ex-US ● A	7.10	5.25	1.57	1.72	6.77	3.77	4.82
MSCI EAFE Index ■ B	4.80	0.49	(0.43)	0.62	5.26	2.80	4.62
Int'l Equity Target ▲	6.80	3.51	0.80	1.13	6.23	2.92	4.00

The Int'l Equity Target currently consists of MSCI ACWI ex U.S. IMI.

International Equity ex Emerging Markets through 9/30/20

Performance vs Callan Non-US Equity (Gross)

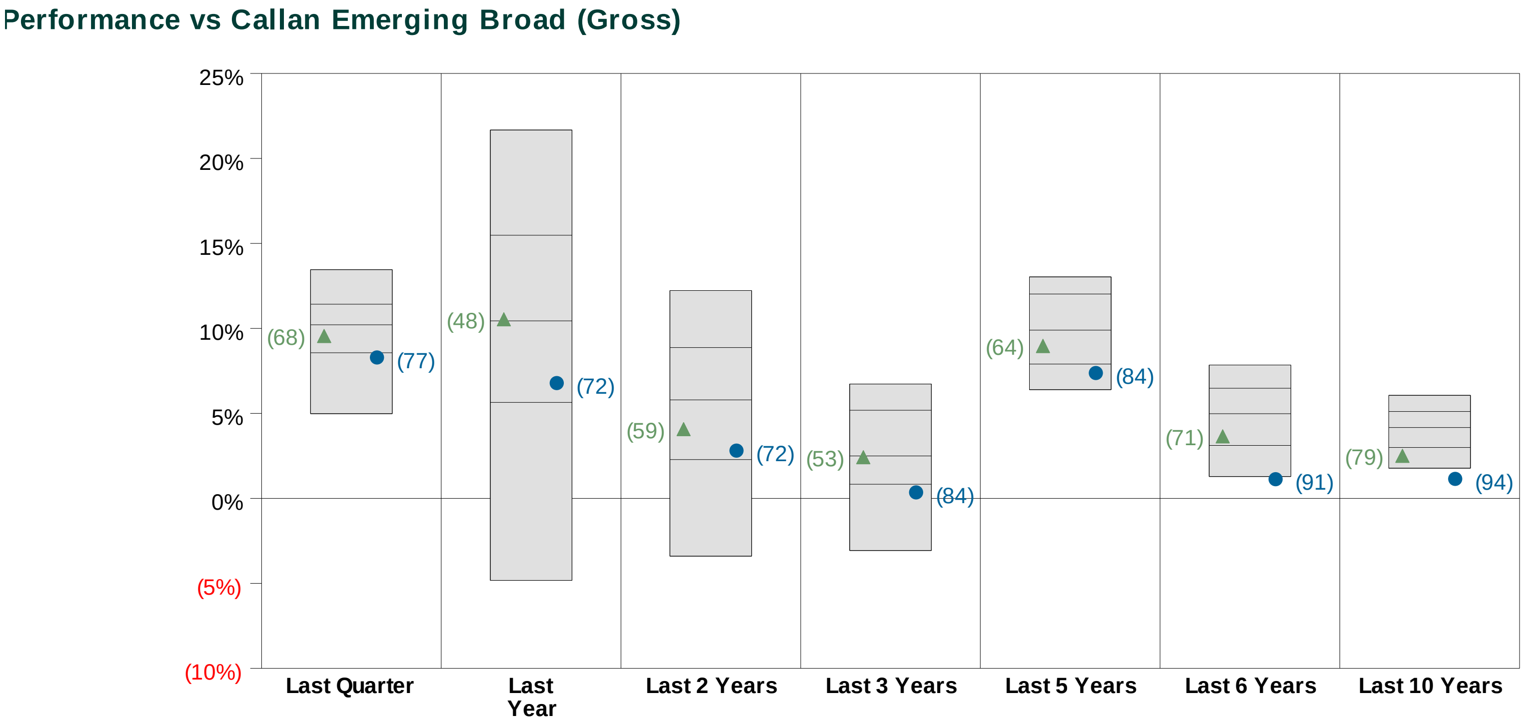


	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	11.41	21.53	11.46	9.51	12.23	8.97	8.77
25th Percentile	9.38	13.42	7.05	5.54	9.13	6.53	7.27
Median	7.18	4.71	1.28	2.30	6.36	4.08	6.21
75th Percentile	4.92	(1.37)	(2.55)	(1.42)	4.58	2.59	4.84
90th Percentile	3.27	(6.82)	(6.08)	(3.56)	2.73	0.86	3.73
Int'l Equity Pool (ex Emerging. Mkt) ●	6.86	4.21	1.39	2.03	6.76	4.12	5.43
MSCI ACWI ex US IMI ▲	6.80	3.51	0.80	1.13	6.31	3.12	4.17

International Equity ex Emerging Markets through 9/30/20

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Int'l Equity Pool (ex Emerging Market)	**6.86%**	**4.21%**	**2.03%**	**6.76%**	**5.43%**
Arrowstreet ACWI ex -US	7.54%	11.03%	4.46%	8.94%	-
Baillie Gifford ACWI ex US	13.29%	29.02%	10.55%	13.19%	-
Brandes Investment	3.20%	(10.53%)	(4.33%)	1.64%	3.42%
Capital Guardian	10.01%	17.64%	9.49%	12.47%	8.35%
L&G Sci Beta Dev ex US	6.34%	(0.71%)	-	-	-
SSgA World ex US IMI	5.61%	1.10%	-	-	-
MSCI EAFE Index	4.80%	0.49%	0.62%	5.26%	4.62%
MSCI ACWI ex-US IMI Index	6.80%	3.51%	1.13%	6.31%	4.17%

Emerging Markets through 9/30/20



	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	13.46	21.68	12.23	6.73	13.03	7.85	6.07
25th Percentile	11.43	15.49	8.88	5.19	12.03	6.48	5.11
Median	10.21	10.45	5.79	2.50	9.90	4.98	4.17
75th Percentile	8.57	5.65	2.29	0.83	7.91	3.12	3.00
90th Percentile	4.98	(4.82)	(3.40)	(3.06)	6.40	1.29	1.78
Emerging Markets Pool ●	8.19	6.69	2.72	0.26	7.28	1.03	1.05
MSCI EM ▲	9.56	10.54	4.08	2.42	8.97	3.65	2.51

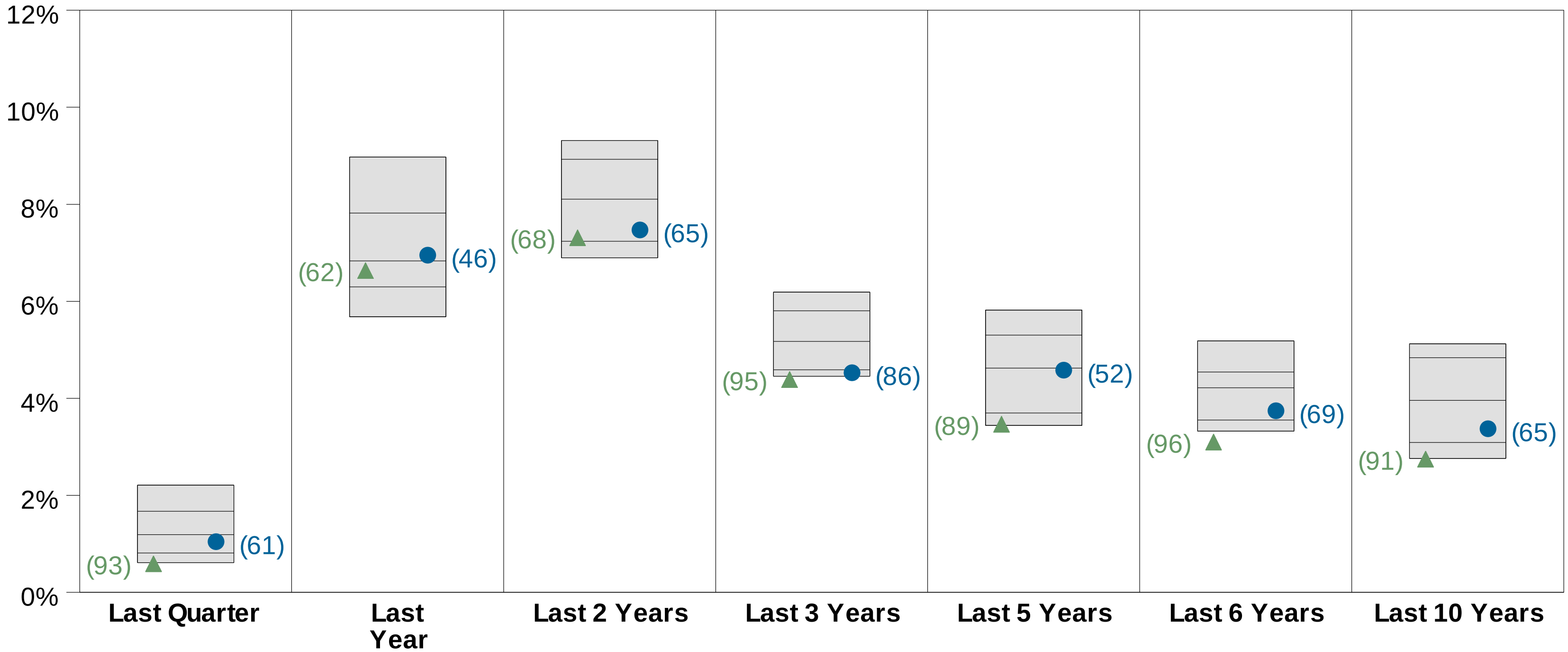
- After underperforming by 3.76% in 2Q17, 1.38% in 3Q17, 1.68% in 4Q17, 4.03% in 2Q18, 1.87% in 1Q19, and 1.41% in 4Q19, the Emerging Markets Pool lags the benchmark and ranks in the bottom quartile over periods of three years and longer.
- DRZ and Lazard were liquidated and L&G Scientific Beta was funded in 4Q19, leaving only passive and smart beta approaches within the emerging markets equity space.

Emerging Markets Pool through 9/30/20

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Emerging Markets Pool	**8.19%**	**6.69%**	**0.26%**	**7.28%**	**1.05%**
SSgA Emerging Markets	9.56%	10.53%	-	-	-
L&G SciBeta EM	5.07%	-	-	-	-
MSCI EM	9.56%	10.54%	2.42%	8.97%	2.51%

Total Fixed Income as of 9/30/20

Performance vs Public Fund - Domestic Fixed (Gross)



	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	2.21	8.97	9.31	6.19	5.82	5.19	5.12
25th Percentile	1.67	7.82	8.93	5.80	5.30	4.54	4.84
Median	1.19	6.83	8.11	5.18	4.62	4.22	3.96
75th Percentile	0.81	6.30	7.24	4.59	3.70	3.55	3.09
90th Percentile	0.61	5.68	6.90	4.46	3.44	3.32	2.76
Total Fixed Income Pool ●	1.01	6.92	7.44	4.49	4.54	3.71	3.34
Fixed Income Target ▲	0.59	6.63	7.31	4.39	3.47	3.10	2.75

- The transition from intermediate Treasury to Aggregate mandates was completed during the fourth quarter of 2019.

Includes In-House and External Portfolios

Total Fixed Income through 9/30/20

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Fixed Income	**1.01%**	**6.92%**	**4.49%**	**4.54%**	**3.34%**
Fixed Income Target	0.59%	6.63%	4.39%	3.47%	2.75%
Blmbg Treasury Intmdt	0.19%	6.03%	4.06%	2.77%	2.34%
ARMB US Aggregate	0.72%	8.35%	-	-	-
Opportunistic Fixed Income	**3.61%**	**(0.09%)**	**4.35%**	**5.97%**	**6.52%**
FIAM Tactical Bond	2.87%	6.02%	5.99%	6.33%	-
Blmbg Aggregate	0.62%	6.98%	5.24%	4.18%	3.64%
FIAM REHI	6.64%	(8.80%)	1.61%	2.72%	-
Blmbg:Universal CMBS xAaa	5.53%	(0.94%)	4.33%	4.20%	5.36%
Alternative Fixed Income	**1.47%**	**1.99%**	**-**	**-**	**-**
Crestline (Blue Glacier)	(0.61%)	1.68%	4.70%	5.99%	6.25%
Prisma Capital (Polar Bear)	5.95%	(0.64%)	2.03%	1.32%	3.35%
Crestline Specialty Lending Fund	11.99%	10.65%	13.31%	12.27%	-
Crestline Specialty Lndg Fd II	16.40%	8.69%	-	-	-
HFRI Fund of Funds Index	4.24%	5.71%	2.88%	3.09%	2.88%
T-Bills + 5%	1.27%	6.10%	6.69%	6.20%	5.64%

Opportunistic through 9/30/20

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Opportunistic (T)	**5.36%**	**5.88%**	**5.66%**	**-**	**-**
Alternative Equity Strategies	**9.69%**	**29.30%**	**12.73%**	**11.86%**	**9.84%**
McKinley Healthcare Transformation	9.69%	29.28%	-	-	-
Russell 1000 Index	9.47%	16.01%	12.38%	14.09%	13.76%
Other Opportunities	**2.47%**	**(0.51%)**	**0.11%**	**2.68%**	**-**
Project Pearl	(0.57%)	(6.66%)	-	-	-
Schroders Insurance Linked	3.66%	1.04%	(3.04%)	-	-
T-Bills + 6%	1.51%	7.10%	7.69%	7.20%	6.64%
Tactical Allocation Strategies	**6.40%**	**8.43%**	**-**	**-**	**-**
PineBridge	7.56%	7.40%	-	-	-
Pine Bridge Benchmark	4.89%	4.68%	2.66%	5.52%	3.36%
Fidelity Signals	5.32%	9.44%	-	-	-
Fidelity Signals Benchmark	5.13%	9.22%	6.38%	7.92%	6.78%
Alternative Beta	**(1.20%)**	**(14.87%)**	**(5.56%)**	**-**	**-**
Man Group Alternative Risk Premia	(1.20%)	(9.63%)	(0.33%)	-	-
T-Bills + 5%	1.27%	6.10%	6.69%	6.20%	5.64%

Real Assets through 9/30/20

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Real Assets	**0.11%**	**0.73%**	**4.91%**	**5.74%**	**7.62%**
Real Assets Target (1)	(1.32%)	(5.30%)	1.74%	3.91%	6.84%
Real Estate	1.60%	1.52%	5.53%	7.17%	10.00%
Real Estate Target (2)	0.78%	0.89%	5.16%	6.44%	9.47%
Private Real Estate	1.70%	4.96%	6.54%	7.64%	10.46%
NCREIF NFI-ODCE Val Wt Nt	0.27%	0.52%	4.25%	5.69%	9.26%
NCREIF Total Index	0.74%	2.00%	5.11%	6.28%	9.37%
ARMB REIT	1.19%	(12.13%)	3.53%	6.50%	9.10%
NAREIT Equity Index	1.19%	(12.15%)	3.54%	6.61%	9.20%
Total Farmland	1.84%	4.67%	4.40%	4.77%	8.08%
UBS Agrivest	2.21%	5.23%	4.89%	5.23%	9.05%
Hancock Agriculture	1.06%	3.52%	3.36%	3.82%	6.33%
ARMB Farmland Target (3)	1.13%	4.31%	5.19%	5.22%	8.96%
Total Timber	1.18%	(0.82%)	3.40%	2.01%	4.95%
Timberland Investment Resources	0.51%	(0.89%)	3.39%	2.15%	4.52%
Hancock Timber	3.00%	(0.65%)	3.48%	1.64%	5.48%
NCREIF Timberland Index	0.04%	0.19%	2.09%	2.56%	4.40%
Total Energy Funds	0.65%	(16.47%)	(4.14%)	(2.83%)	(2.08%)
CPI + 5%	2.36%	6.50%	6.78%	6.77%	6.72%
Total Infrastructure	2.01%	5.33%	10.52%	9.78%	-
JPM Infrastructure	1.75%	6.65%	6.76%	7.08%	-
IFM Infrastructure	2.07%	5.03%	12.72%	12.15%	-
CPI + 4%	2.13%	5.50%	5.78%	5.77%	5.72%
Global Infrastructure Idx	1.58%	(13.89%)	(1.38%)	4.46%	5.52%

(1) As of 10/01/2019, Real Assets Target is 37.5% NFI-ODCE Value Weight Net Index, 10% FTSE NAREIT All Equity Index, 25% NCREIF Farmland Index, 10% NCREIF Timberland Index, 17.5% CPI+4.

(2) ARMB Custom Real Estate Target is 90% NCREIF Property Index and 10% FTSE NAREIT All Equity REIT Index.

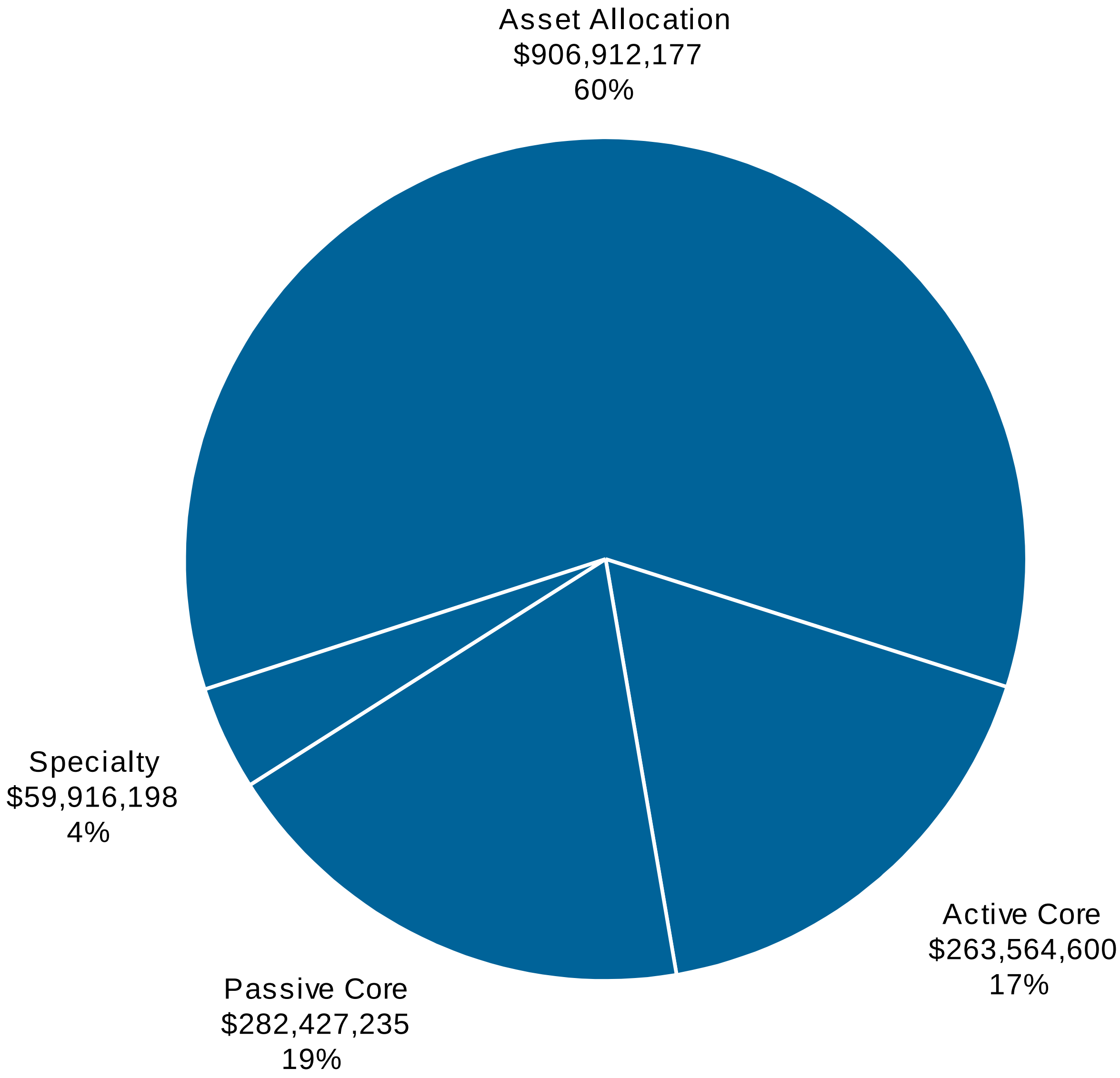
(3) ARMB Custom Farmland Target is leased-only properties in the NCREIF Farmland Index reweighted to reflect 90% row crops and 10% permanent crops until 1/1/08 and 80% row crops and 20% permanent crops thereafter .

Farmland and Timber data supplied by the manager and may vary from State Street returns due to timing variations.

Participant-Directed Plans

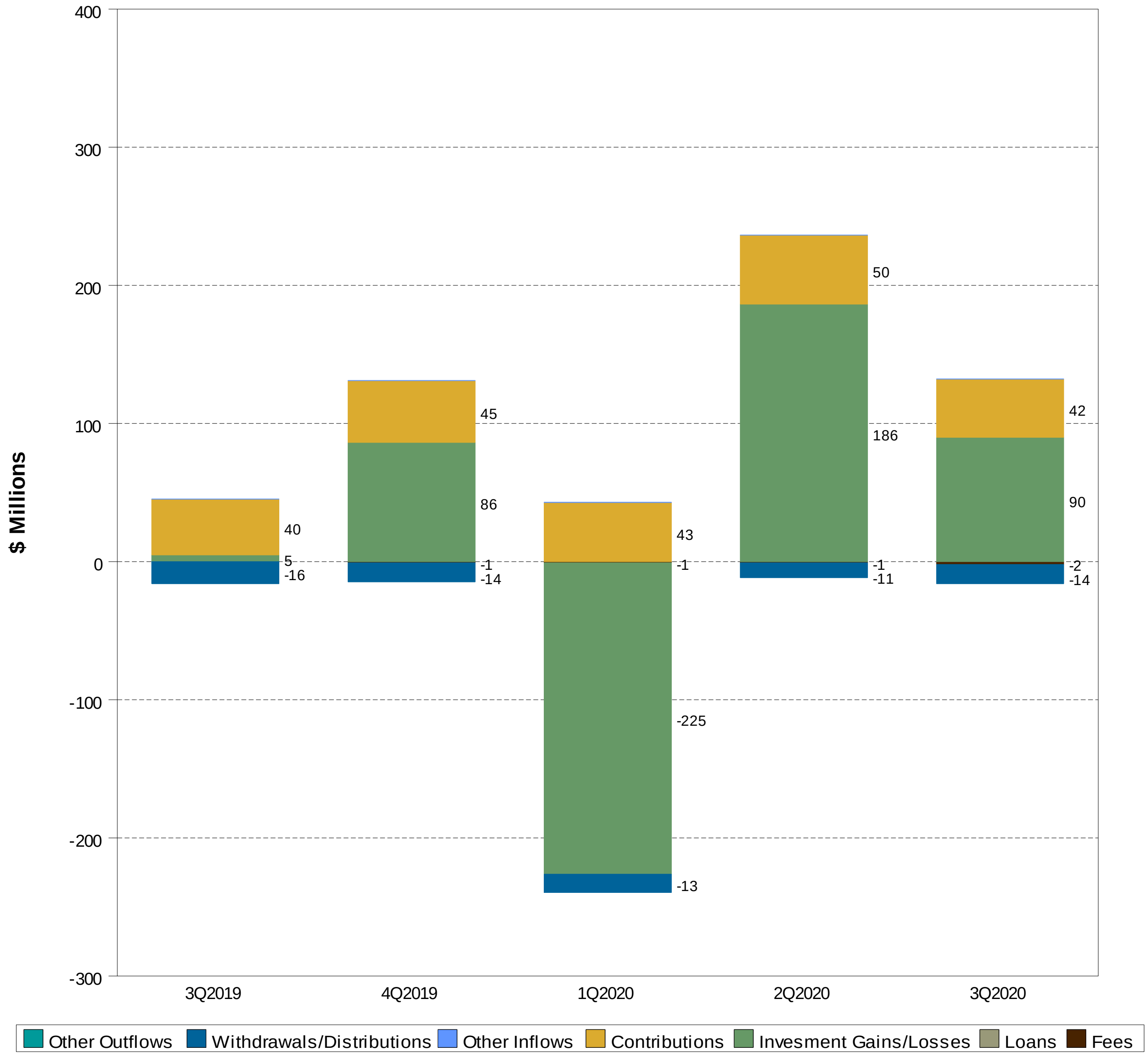
PERS DC Plan

September 30, 2020



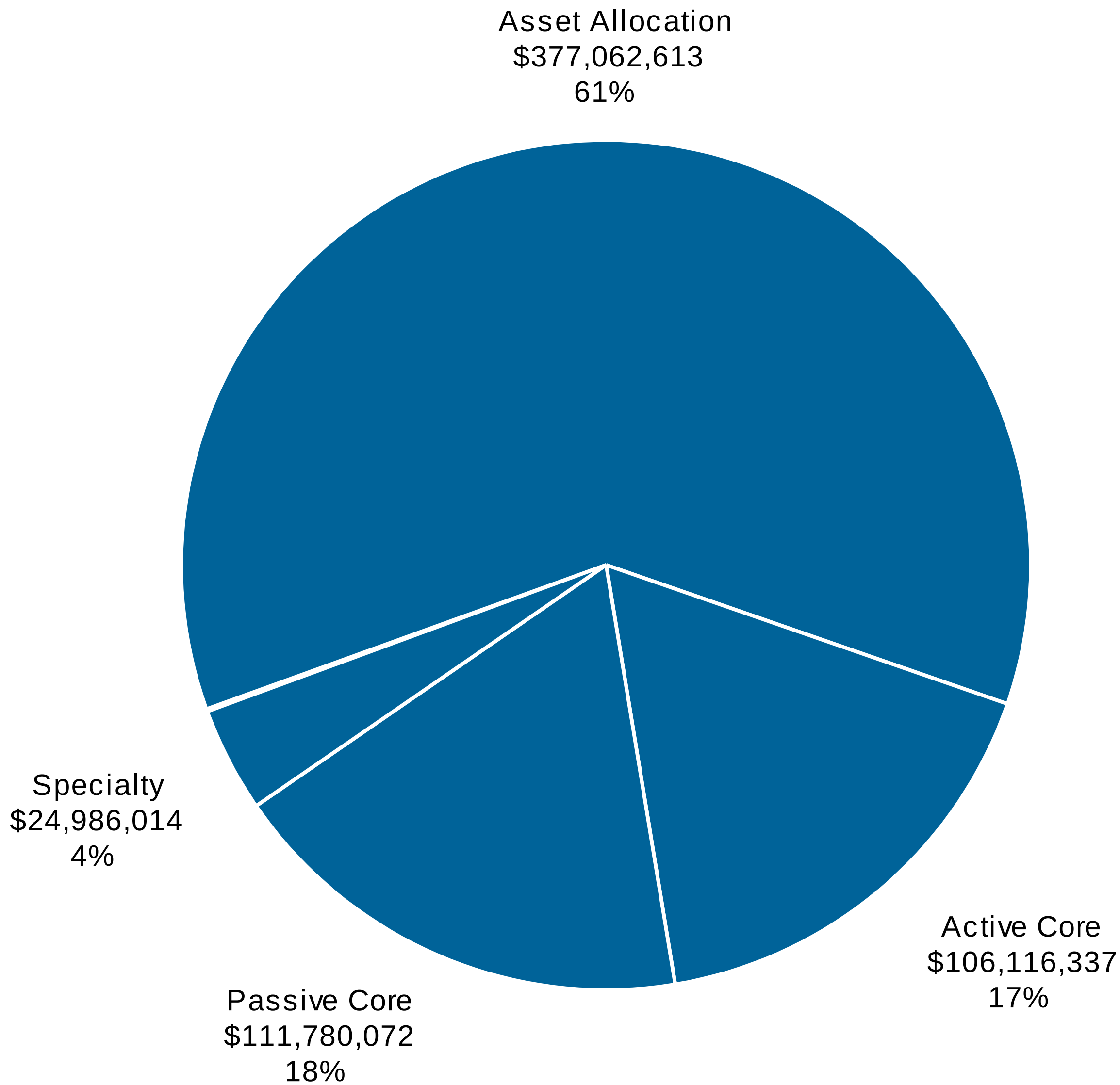
PERS DC Plan: Asset Changes

September 30, 2020



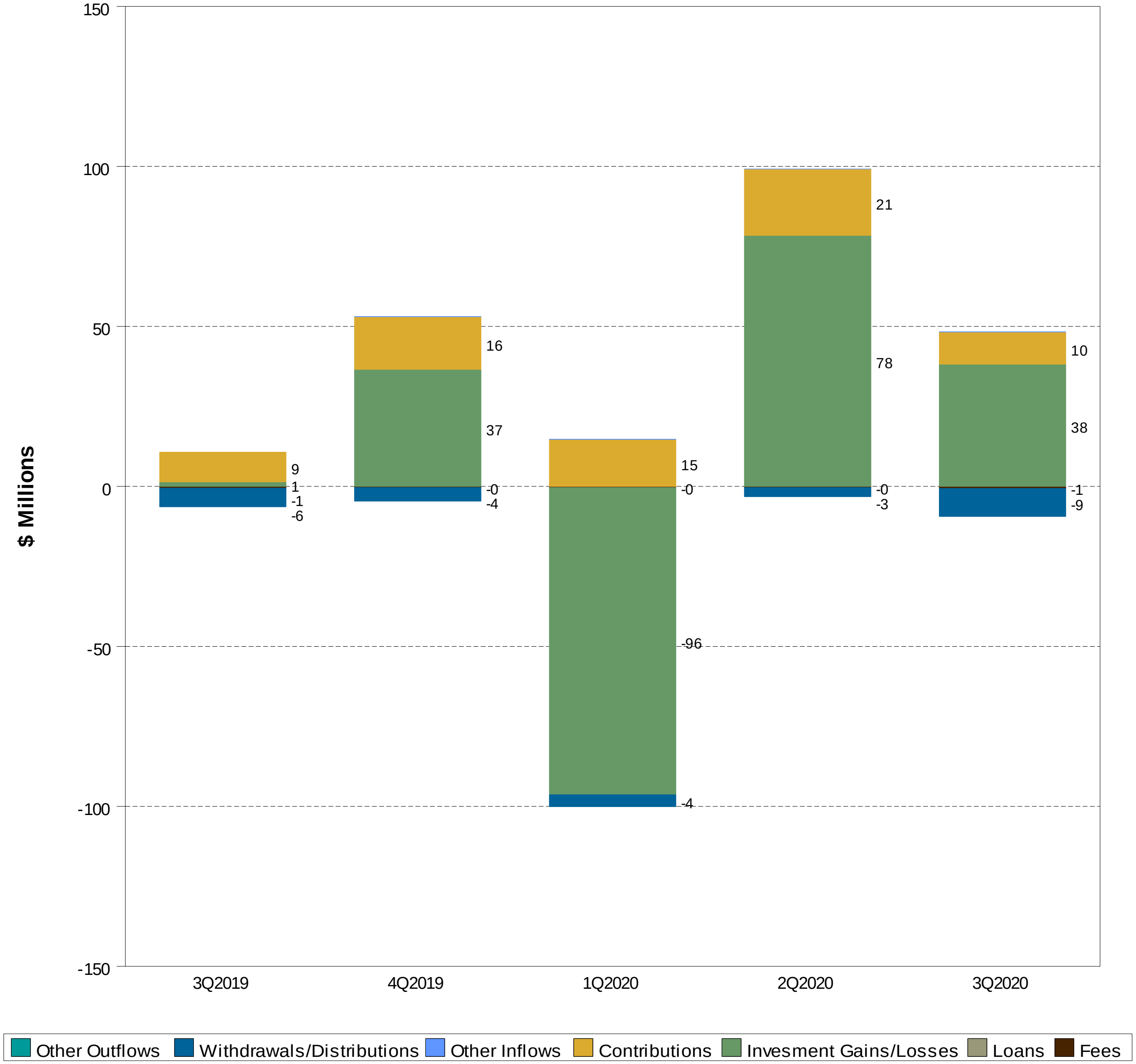
TRS DC Plan

September 30, 2020



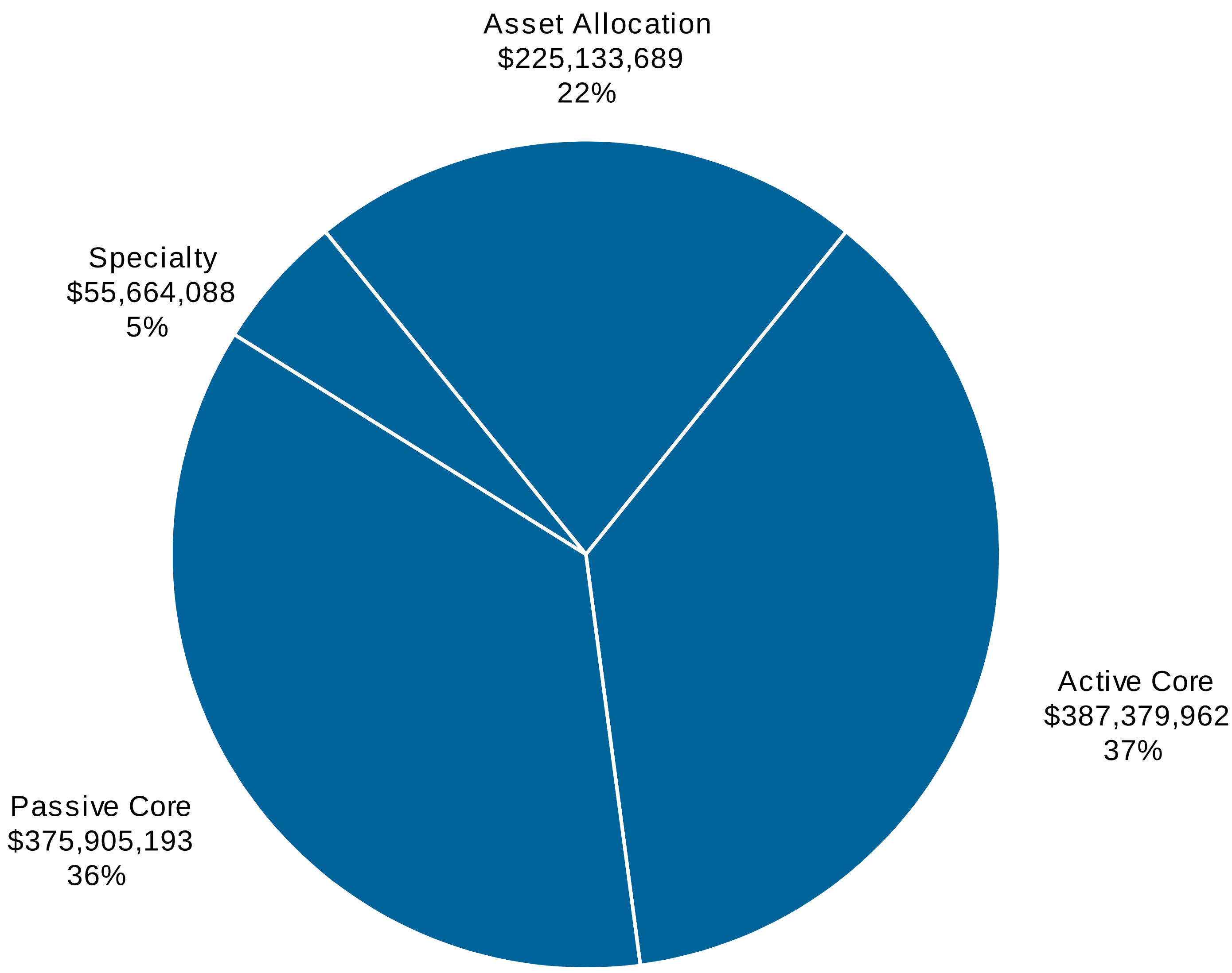
TRS DC Plan: Asset Changes

September 30, 2020



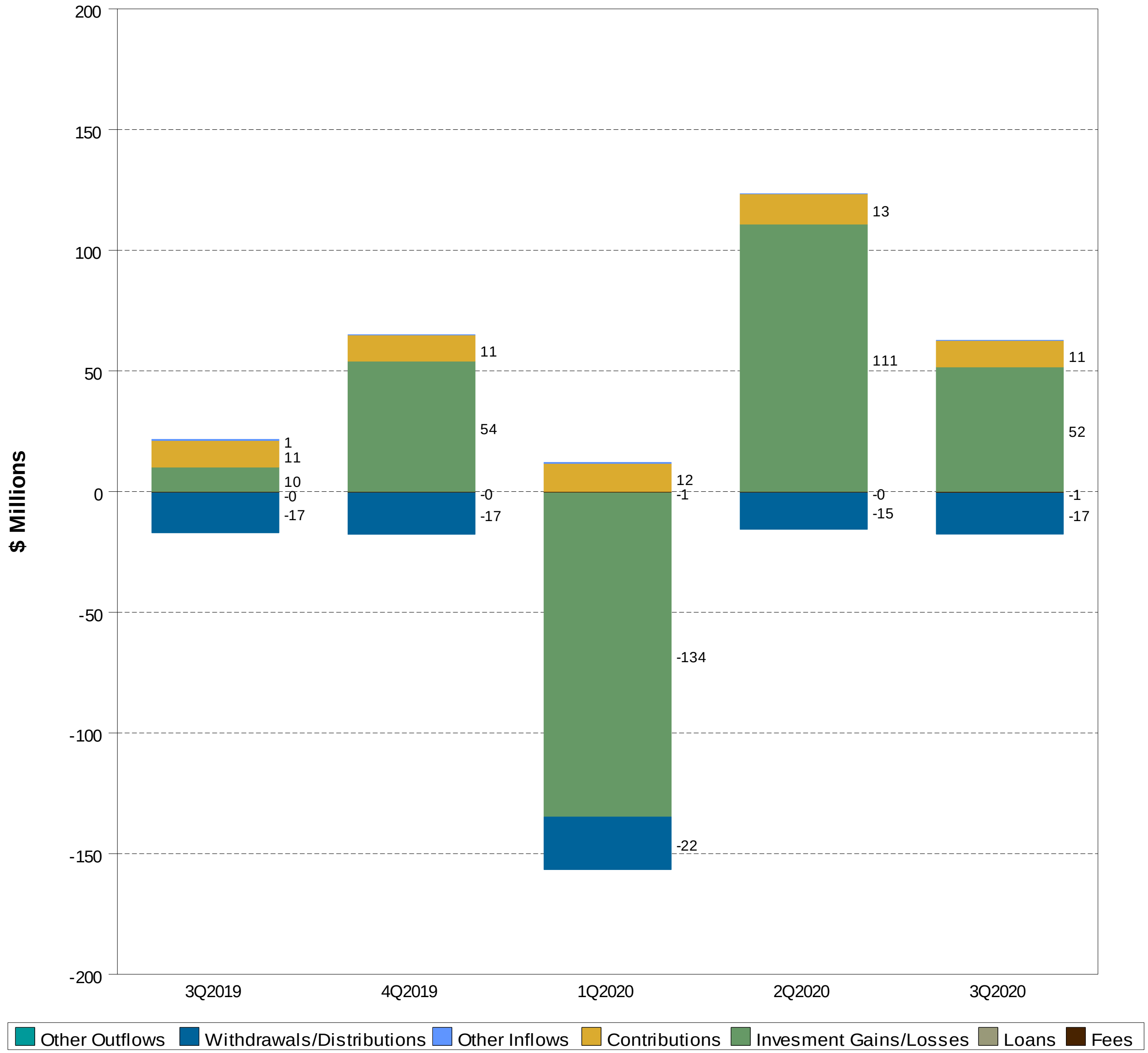
Deferred Comp Plan

September 30, 2020



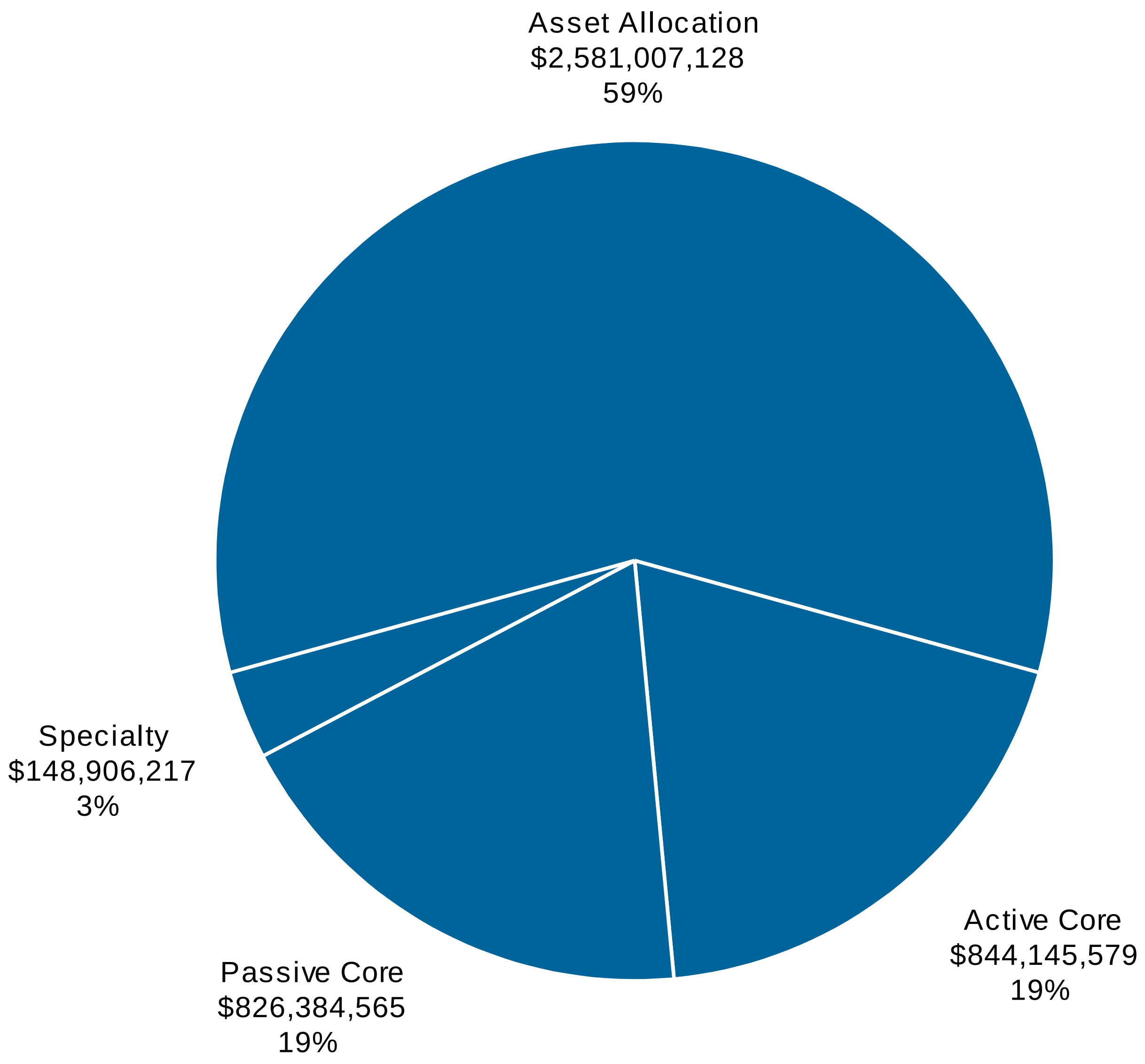
Deferred Comp Plan: Asset Changes

September 30, 2020



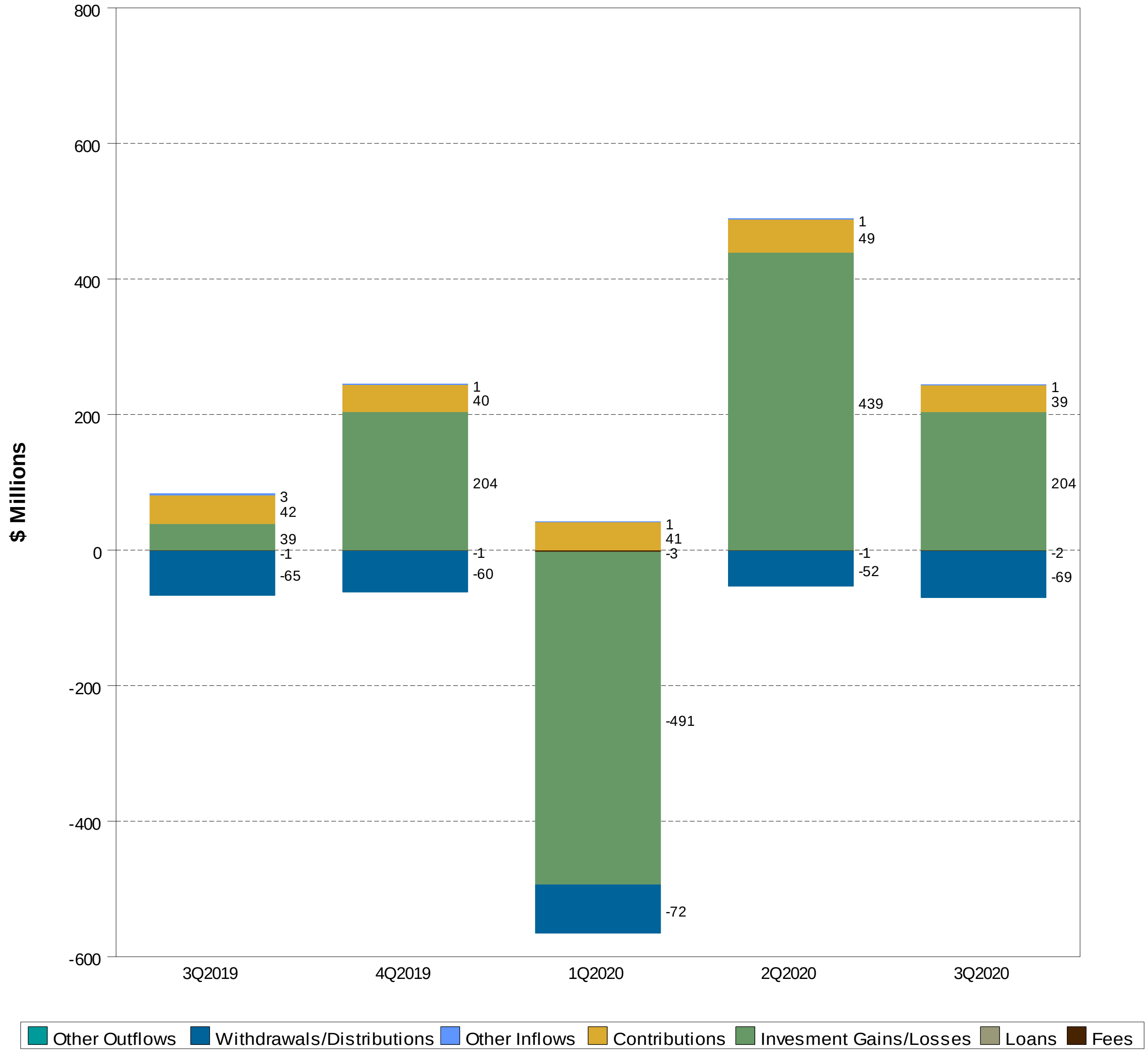
SBS Fund

September 30, 2020



SBS Fund: Asset Changes

September 30, 2020



Individual Account Option Performance: 9/30/20

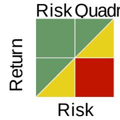
Balanced & Target Date Funds

Investment Manager	Last Quarter Return	Last Year Return	3 Year Return	5 Year Return	7 Year Return	5 Year Risk	5 Year Risk Quadrant	5 Year Excess Rtn Ratio	3 Year Tracking Error	5 Year Sharpe Ratio
Asset Allocation										
Alaska Balanced Trust	**3.3** 44	**8.5** 12	**6.1** 12	**6.4** 17	**5.6** 17	**6.1** 71		**-0.1** 21	**0.3** 100	**0.9** 10
CAI MA Tgt Alloc Cons MFs										
Passive Target	3.3 43	8.2 14	6.1 12	6.4 17	5.6 17	6.2 67				0.8 10
Alaska Long-Term Balanced	**5.2** 32	**9.9** 22	**7.0** 24	**8.3** 25	**7.2** 25	**10.2** 61		**-0.6** 52	**0.4** 100	**0.7** 24
CAI MA Tgt Alloc Mod MFs										
Passive Target	5.3 32	9.7 23	7.2 21	8.5 23	7.3 23	10.4 58				0.7 23
Target 2010 Trust	**3.6** 50	**7.9** 54	**5.9** 54	**6.7** 56	**5.9** 39	**7.0** 51		**-0.3** 78	**0.3** 100	**0.8** 39
CAI Tgt Date 2010										
Custom Index	3.6 45	7.7 65	6.0 50	6.8 51	5.9 37	7.2 49				0.8 40
Target 2015 Trust	**4.2** 29	**8.7** 23	**6.4** 20	**7.5** 28	**6.6** 22	**8.1** 40		**-0.0** 30	**0.3** 100	**0.8** 30
CAI Tgt Date 2015										
Custom Index	4.1 31	8.3 37	6.4 20	7.5 28	6.6 22	8.3 39				0.8 34
Target 2020 Trust	**4.9** 20	**9.3** 12	**6.9** 10	**8.4** 14	**7.3** 9	**9.7** 22		**-0.1** 15	**0.4** 99	**0.7** 28
CAI Tgt Date 2020										
Custom Index	4.9 20	9.0 21	6.9 10	8.4 14	7.3 9	9.9 21				0.7 32
Target 2025 Trust	**5.6** 10	**9.9** 15	**7.3** 9	**9.1** 6	**7.8** 6	**11.2** 17		**-0.2** 11	**0.4** 100	**0.7** 22
CAI Tgt Date 2025										
Custom Index	5.6 12	9.7 18	7.3 8	9.2 5	7.8 6	11.4 15				0.7 29
Target 2030 Trust	**6.2** 10	**10.4** 14	**7.6** 14	**9.7** 15	**8.3** 9	**12.6** 26		**-0.3** 23	**0.4** 100	**0.7** 17
CAI Tgt Date 2030										
Custom Index	6.2 10	10.1 21	7.7 13	9.8 13	8.4 9	12.8 22				0.7 17
Target 2035 Trust	**6.8** 12	**10.9** 14	**7.9** 9	**10.3** 16	**8.7** 6	**13.7** 44		**-0.3** 21	**0.4** 100	**0.7** 12
CAI Tgt Date 2035										
Custom Index	6.8 16	10.7 16	8.0 8	10.4 11	8.8 5	13.9 38				0.7 14
Target 2040 Trust	**7.2** 16	**11.2** 14	**8.1** 9	**10.6** 10	**9.0** 7	**14.7** 49		**-0.3** 21	**0.4** 100	**0.6** 8
CAI Tgt Date 2040										
Custom Index	7.2 19	11.0 17	8.2 7	10.7 8	9.0 5	14.8 45				0.6 8
Target 2045 Trust	**7.6** 16	**11.2** 18	**8.2** 8	**10.7** 8	**9.1** 5	**15.3** 61		**-0.4** 16	**0.4** 98	**0.6** 7
CAI Tgt Date 2045										
Custom Index	7.6 16	11.1 21	8.3 4	10.9 4	9.1 4	15.5 56				0.6 7

Returns:
- above median
- third quartile
- fourth quartile

Risk:
- below median
- second quartile
- first quartile

Risk Quadrant:



Excess Return Ratio:
- above median
- third quartile
- fourth quartile

Tracking Error:
- below median
- second quartile
- first quartile

Sharpe Ratio:
- above median
- third quartile
- fourth quartile

Individual Account Option Performance: 9/30/20

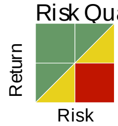
Balanced & Target Date Funds

Investment Manager	Last Quarter Return	Last Year Return	3 Year Return	5 Year Return	7 Year Return	5 Year Risk	5 Year Risk Quadrant	5 Year Excess Rtn Ratio	3 Year Tracking Error	5 Year Sharpe Ratio
Target 2050 Trust	**7.6** 24	**11.2** 21	**8.2** 8	**10.7** 9	**9.1** 7	**15.3** 71		**-0.4** 19	**0.4** 99	**0.6** 5
CAI Tgt Date 2050 Custom Index	7.6 26	11.1 23	8.3 5	10.9 5	9.1 6	15.5 65				0.6 5
Target 2055 Trust	**7.6** 31	**11.3** 20	**8.2** 7	**10.7** 10	**9.1** 8	**15.3** 75		**-0.4** 19	**0.4** 99	**0.6** 5
CAI Tgt Date 2055 Custom Index	7.6 33	11.1 23	8.3 5	10.9 7	9.1 6	15.5 69				0.6 5
Target 2060 Trust	**7.6** 29	**11.1** 23	**8.0** 12						**0.4** 100	
CAI Tgt Date 2060 Custom Index	7.6 32	11.1 23	8.3 4							
Target 2065 Trust	**7.6** 42									
CAI Tgt Date 2065 Custom Index	7.6 41									

Returns:
- above median
- third quartile
- fourth quartile

Risk:
- below median
- second quartile
- first quartile

Risk Quadrant:



Excess Return Ratio:
- above median
- third quartile
- fourth quartile

Tracking Error:
- below median
- second quartile
- first quartile

Sharpe Ratio:
- above median
- third quartile
- fourth quartile

Other Options: 9/30/20

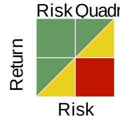
Passive Strategies

Investment Manager	Last Quarter Return	Last Year Return	3 Year Return	5 Year Return	7 Year Return	5 Year Risk	5 Year Risk Quadrant	5 Year Excess Rtn Ratio	3 Year Tracking Error	5 Year Sharpe Ratio
Index Funds										
SSgA S&P 500 Index Fund (i)	**8.9** 9	**15.1** 18	**12.3** 14	**14.1** 10	**12.7** 15	**16.9** 46		**-0.4** 10	**0.0** 85	**0.8** 8
Callan S&P 500 Index MFs										
S&P 500 Index	8.9 9	15.1 8	12.3 8	14.1 8	12.7 8	16.9 37				0.8 8
SSgA Russell 3000 Index Fund (i)	**9.2** 50	**15.0** 50	**11.6** 49	**13.7** 46	**12.1** 49	**17.7** 57		**-0.5** 57	**0.0** 100	**0.7** 50
CAI Mut Fd: Large Cap Broad Style (Net)										
Russell 3000 Index	9.2 50	15.0 50	11.6 49	13.7 46	12.1 49	17.8 57				0.7 50
SSgA World Equity ex-US Index Fund (i)	**6.2** 54	**3.4** 54	**1.4** 50	**6.4** 43	**3.3** 54	**17.1** 76		**0.2** 40	**0.9** 100	**0.3** 44
CAI MF: Non-U.S. Equity Style										
MSCI ACWI x U.S. Index (Net)	6.3 53	3.0 56	1.2 51	6.2 44	3.2 55	16.7 83				0.3 45
BlackRock Passive US Bd Index Fund (i)	**0.6** 95	**6.9** 72								
Callan Core Bond MFs										
Blmbg Aggregate	0.6 95	7.0 71	5.2 64	4.2 74	4.0 62	3.3 84				0.9 50

Returns:
- above median
- third quartile
- fourth quartile

Risk:
- below median
- second quartile
- first quartile

Risk Quadrant:



Excess Return Ratio:
- above median
- third quartile
- fourth quartile

Tracking Error:
- below median
- second quartile
- first quartile

Sharpe Ratio:
- above median
- third quartile
- fourth quartile

(i) – Indexed scoring method used. Green: manager & index ranking differ by less than +/- 10 percentiles; Yellow: manager and index ranking differ by +/- 20 percentiles; Red: manager & index ranking differ by more than 20 percentiles.

Other Options: 9/30/20

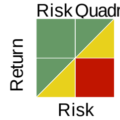
Active Equity, Stable Value, and Money Market

Investment Manager	Last Quarter Return	Last Year Return	3 Year Return	5 Year Return	7 Year Return	5 Year Risk	5 Year Risk Quadrant	5 Year Excess Rtn Ratio	3 Year Tracking Error	5 Year Sharpe Ratio
Active and Other Funds										
BlackRrock Strategic Completion Fd	**4.1** 59	**-2.7** 58								
Callan Real Assets MFs										
Strategic Completion Custom Index	4.1 59	-3.2 60								
Northern Trust ESG Fund	**8.1** 58	**15.1** 50								
Callan Lg Cap Broad MF										
MSCI USA ESG	8.1 58	15.3 50	12.9 46	14.1 46	12.1 50	15.9 92				0.8 38
International Equity Fund	**7.8** 36	**8.8** 34	**2.0** 46	**4.8** 62		**18.1** 45		**-0.4** 60	**3.6** 64	**0.2** 60
CAI Mut Fd: Non-U.S. Equity Style										
MSCI ACWI ex US Index	6.3 53	3.0 56	1.2 51	6.2 44	3.2 55	16.7 83				0.3 45
T. Rowe Price Small Cap	**7.6** 41	**7.1** 52	**10.3** 38	**13.4** 36	**10.6** 33	**20.7** 90		**1.3** 2	**4.5** 86	**0.6** 23
CAI Mut Fd: Sm Cap Broad Style										
Russell 2000 Index	4.9 58	0.4 58	1.8 59	8.0 55	6.4 56	23.0 67				0.3 54
T. Rowe Price Stable Value	**0.6** 2	**2.5** 1	**2.5** 1	**2.4** 1	**2.5** 1	**0.1** 91		**3.3** 6	**0.3** 12	**17.2** 1
Callan Stable Value CT										
FTSE 3 Mo T-Bill	0.0 99	1.0 99	1.6 84	1.2 99	0.8 99	0.4 1				-0.1 99
SSgA Inst Treasury Money Market	**0.0** 26	**0.8** 11	**1.5** 10	**1.0** 9	**0.7** 10	**0.4** 9		**-3.3** 23	**0.0** 91	**-0.4** 9
Callan Money Market Funds										
FTSE 3 Mo T-Bill	0.0 4	1.0 2	1.6 1	1.2 2	0.8 2	0.4 7				-0.1 2

Returns:
- above median
- third quartile
- fourth quartile

Risk:
- below median
- second quartile
- first quartile

Risk Quadrant:



Excess Return Ratio:
- above median
- third quartile
- fourth quartile

Tracking Error:
- below median
- second quartile
- first quartile

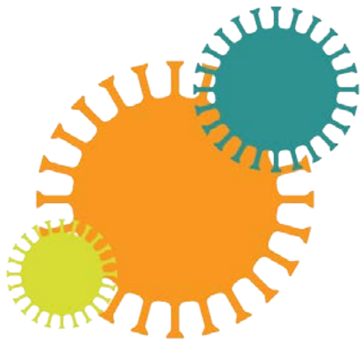
Sharpe Ratio:
- above median
- third quartile
- fourth quartile

Callan Update

Published Research Highlights from 3Q20

Private Equity Fees and Terms Study

Coping with COVID-19: Investment Manager Survey, 2nd Edition



2020 ESG Survey

How New Risk-Retention Rules Affect the CMBS Market

Recent Blog Posts

How Investors Can Address Climate Risk in Real Estate

Munir Iman and Aaron Quach

Fine-Tuning Implementation of the CARES Act

Jana Steele

Plus our blog contains a wide array of posts related to the pandemic

Additional Reading

Private Equity Trends quarterly newsletter

Active vs. Passive quarterly charts

Capital Market Review quarterly newsletter

Monthly Updates to the Periodic Table

Market Pulse Flipbook quarterly markets update

Callan Institute Events

Upcoming conferences, workshops, and webinars

"Callan College"

Introduction to Investments—Virtual

This program familiarizes institutional investor trustees and staff and asset management advisers with basic investment theory, terminology, and practices. It is held over three days with virtual modules of 2.5-3 hours. This course is designed for individuals with less than two years of experience with asset-management oversight and/or support responsibilities. Tuition is $950 per person and includes instruction and digital materials.

Next Session: April 13-15, 2021

Additional information can be found at:
www.callan.com/cc-introduction-virtual/

"Research, education, and dialogue are more important than ever in these extraordinary times, which is why I'm pleased to announce that we are adding more webinars, and we plan to expand our events to include roundtables and other interactive digital offerings."

Barb Gerraty
Director, Callan Institute

Upcoming Webinars

Callan's Capital Markets Assumptions
January 14, 2021

Learn about our 2021-2030 Capital Markets Assumptions and the potential implications for strategic recommendations.

Details at www.callan.com/callan-institute-events

Market Intelligence Special Edition

January 22, 2021

Get insights on the current environment, including trends for equities, fixed income, alternative investments, and defined contribution plans; an overview of the capital markets; and case studies analyzing how institutional investors are addressing the financial stresses from the pandemic.

Save the Date!

2021 National Conference

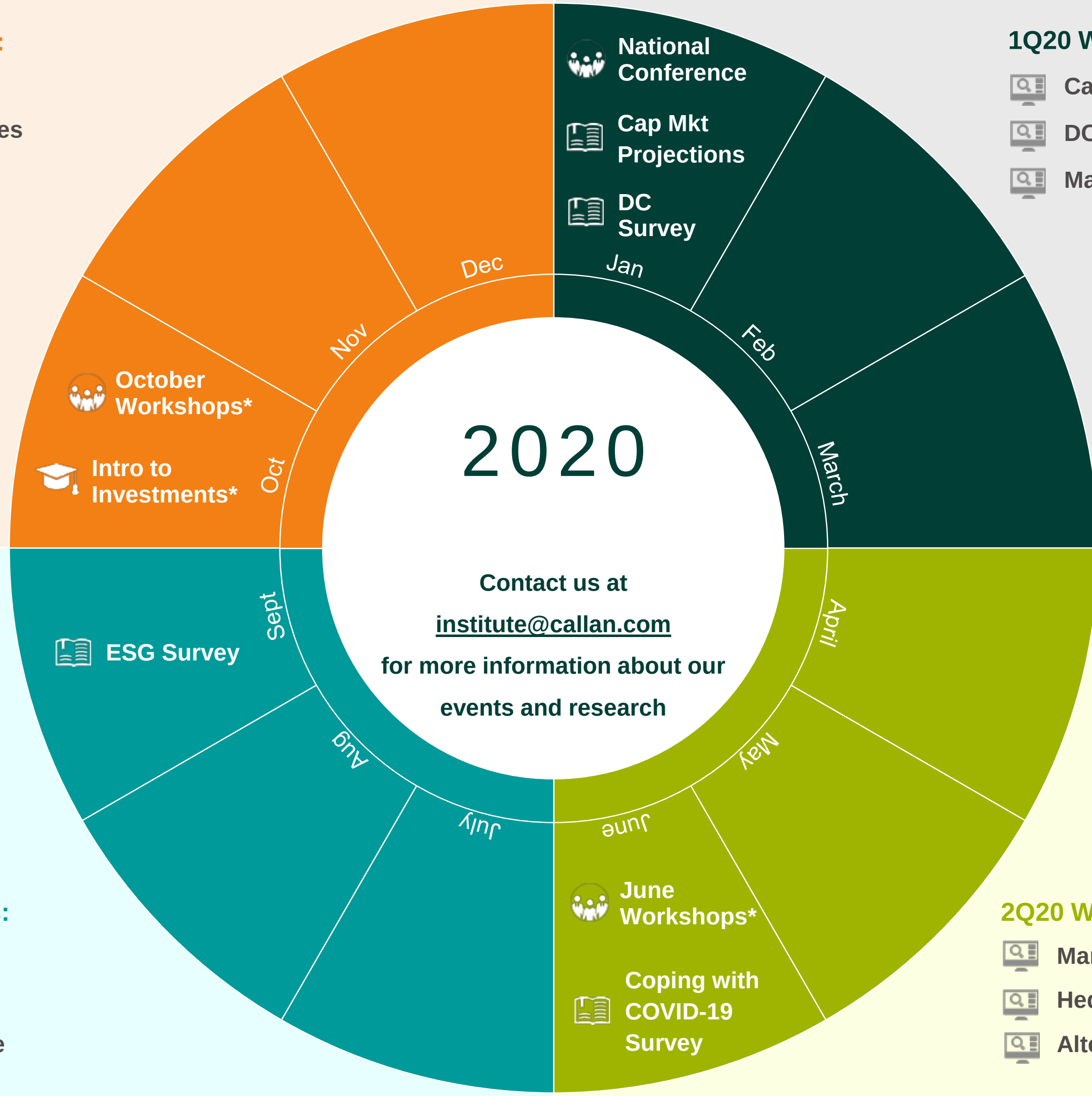
June 21-23, 2021

We can't wait to see you!

Content Calendar – Callan Institute

4Q20 Webinar Topics:
- Market Intelligence
- ESG Interview Series

1Q20 Webinar Topics:
- Capital Market Assumptions
- DC Trends Survey
- Market Intelligence



3Q20 Webinar Topics:
- China
- Private Credit
- Market Intelligence

2Q20 Webinar Topics:
- Market Intelligence
- Hedge Funds
- Alternatives

"Callan College" | Conference/Workshop | Publication | Webinar

*Held virtually, program may be modified

ALASKA RETIREMENT MANAGEMENT BOARD

Internally Managed Fixed Income

December 2020

Victor Djajalie, CFA
Director of Internal Fixed Income

Casey Colton, CFA
State Investment Officer

Key Board Decisions

Determine Investment Objective

- Fund's Purpose
- Governance – who makes which decisions?

Determine Asset Allocation

- Strategic
- Tactical

Oversee Implementation

- Manager Structure – number and types of manager allocations.
- Manager Selection

Monitor Results

- Are the fund, asset classes and mandates performing as expected?
- Are they achieving objectives?

Presentation Agenda

- Fixed Income Market Outlook
- Role of Fixed Income
- Internal Fixed Income Process
  - Portfolio Positioning
  - Portfolio Performance

Fixed Income Investment Team

Victor Djajalie, CFA
Corporate/Government Bond Trading
Credit Research

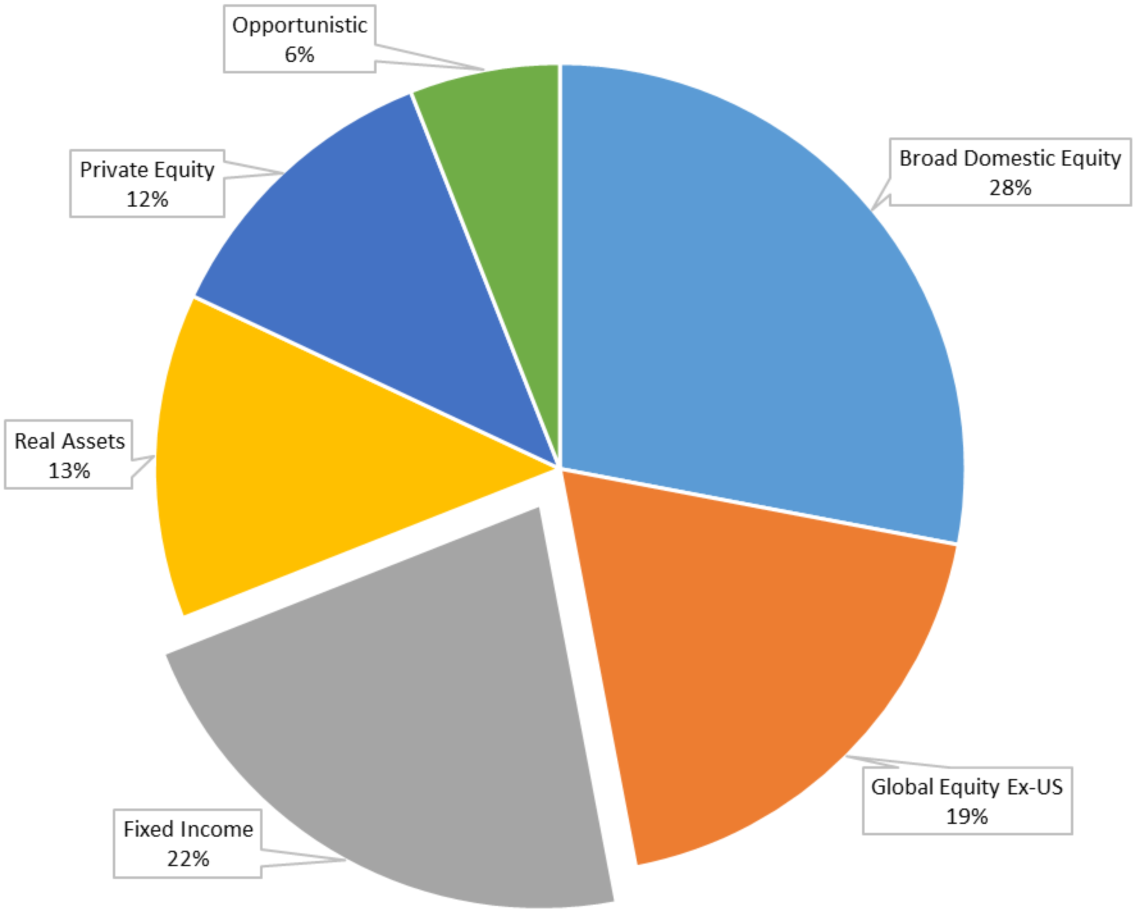
Casey Colton, CFA
Government/MBS

Emily Howard
ABS/CMBS

Nick Orr, CFA
MBS/CMBS

Stephanie Pham
Credit Research
Op/Analytics

ARMB Target Asset Allocation
Fiscal Year 2021



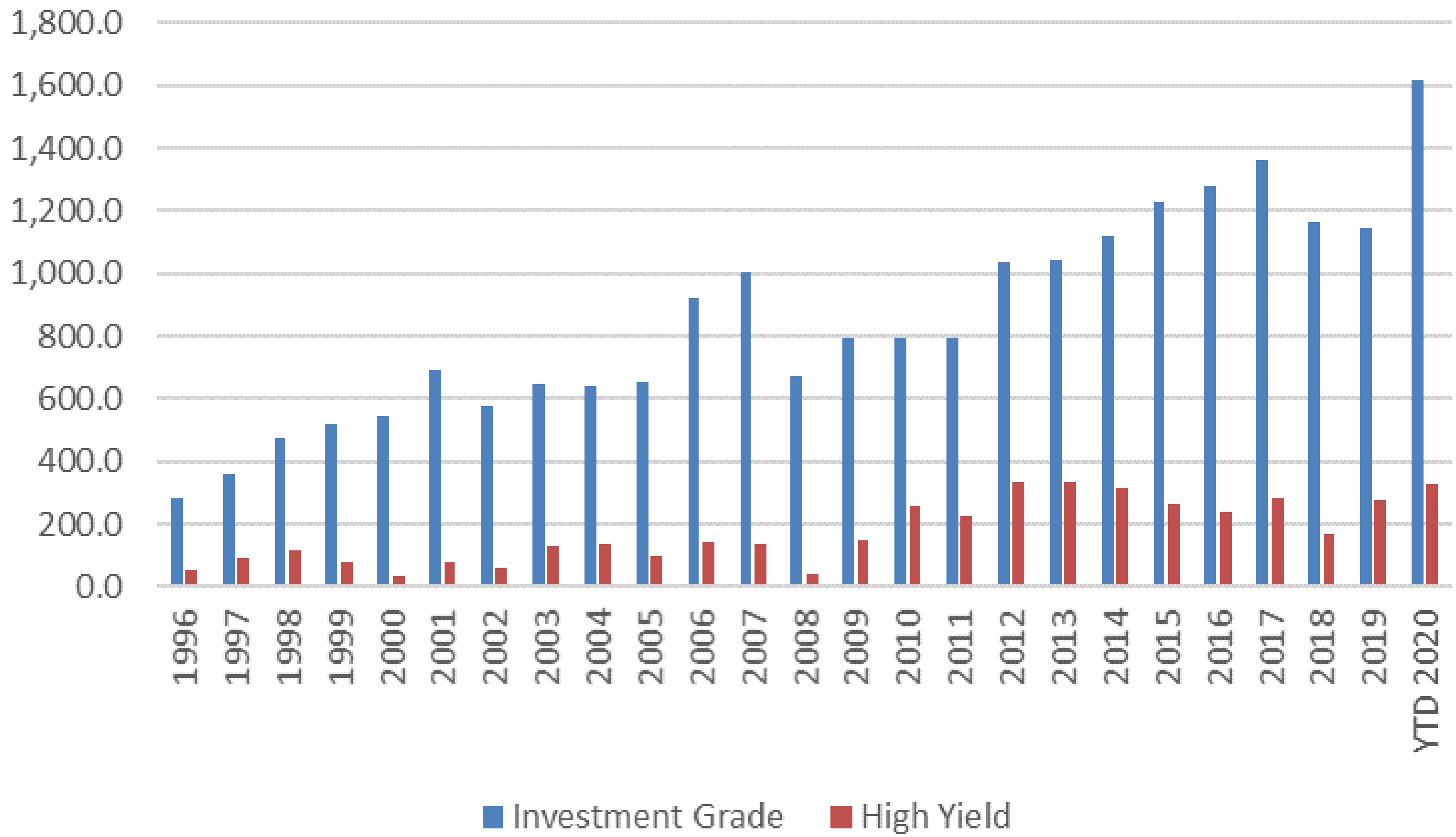
Fixed Income Market Outlook

10 Year US Treasury Yields

Source: Bloomberg

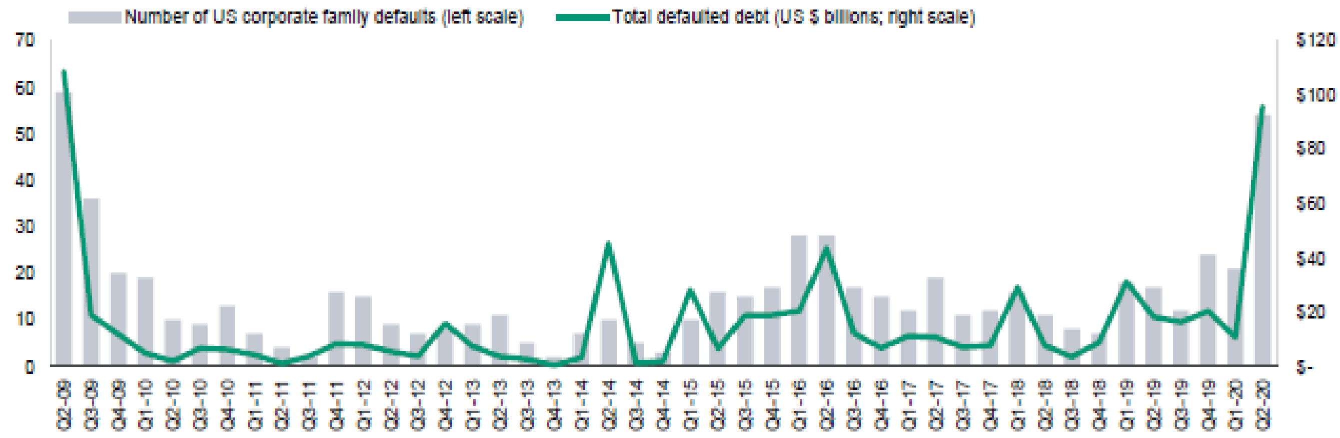
- US Treasury yields have been trending lower and are likely to remain low for the foreseeable future as global central banks continue to promote accommodative monetary policy.
- US Treasuries continue to be attractive to foreign investors as the yield is higher than other developed countries' sovereign debt. In addition, US Treasuries continue to benefit from their safe haven status as the most liquid and safest securities in the world.

Corporate Bond Net Issuance



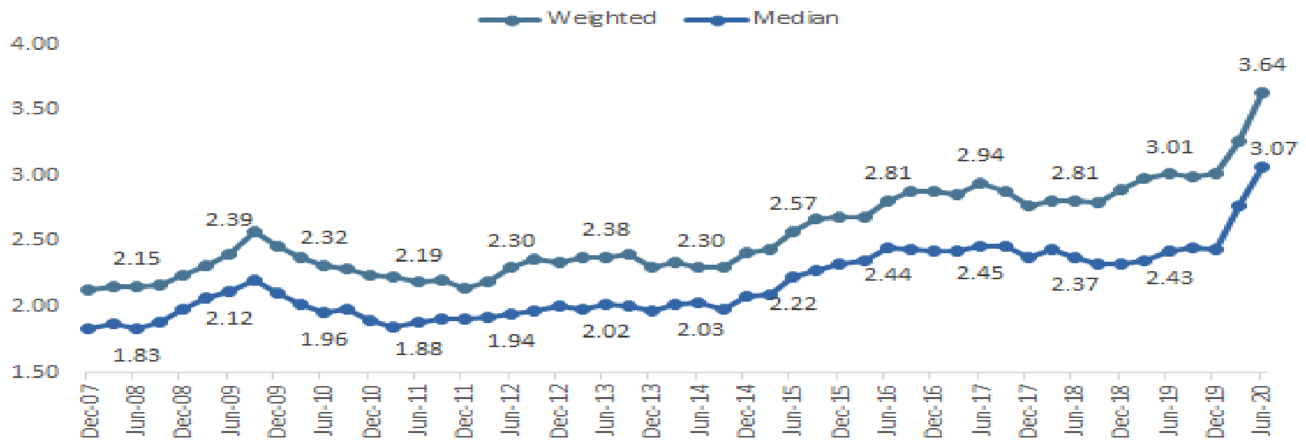
Source: Sifma

Corporate Defaults



Source: Moody's Investors Service

US IG Gross Leverage



Source: CreditSights, ICE BofAML Indices, FactSet

Investment Grade Corporate Spreads

Source: Bloomberg

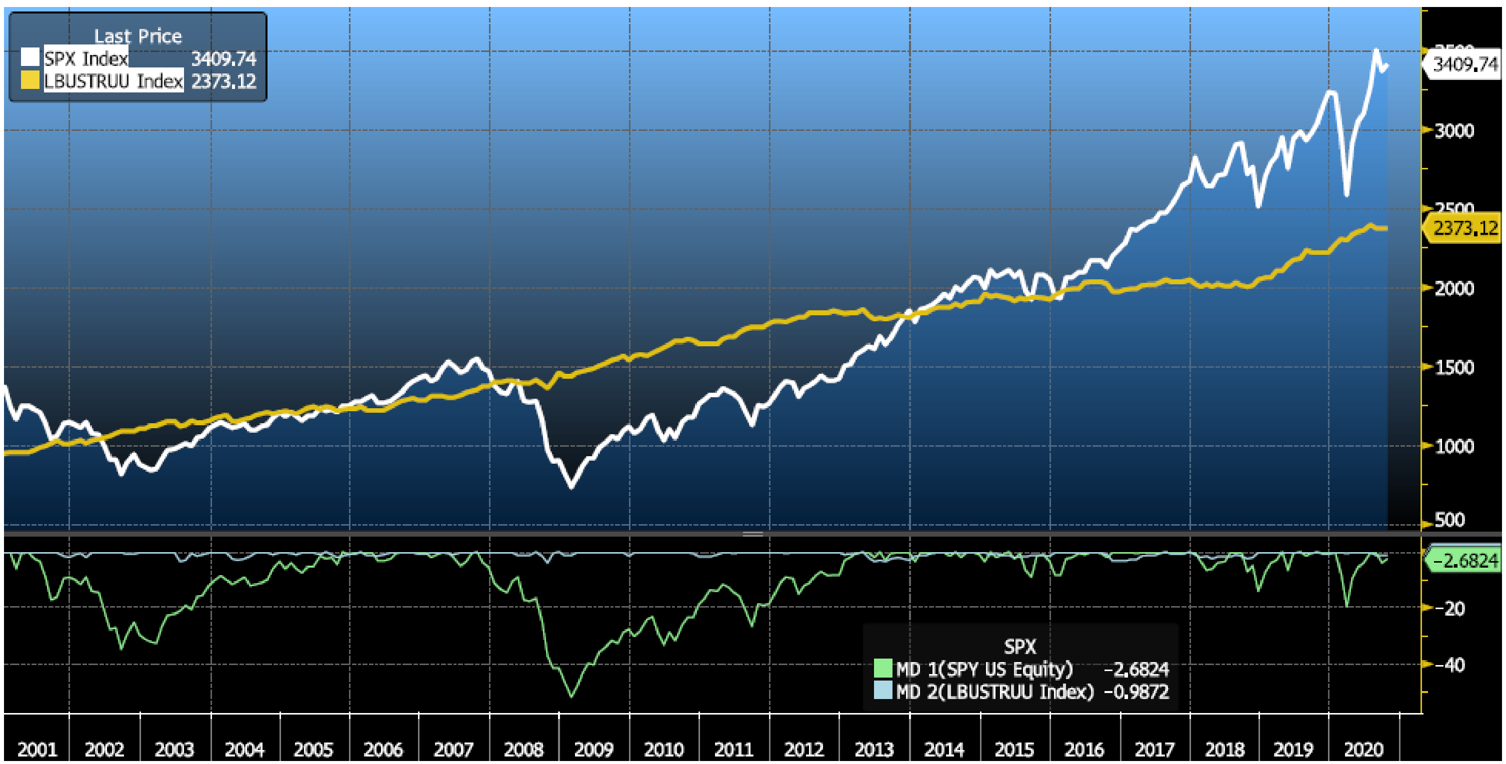
- Strong demand from domestic and foreign investors continued to drive investment grade spreads tighter despite weaker credit fundamentals and record issuance in 2020.

Role of Fixed Income in Asset Allocation

- Portfolio diversification
  - It reduces overall portfolio risk as it has a lower risk profile and a low correlation with other asset classes.
- Yield
  - Provides steady and stable yield that is used to meet required benefit payments.
- Liquidity
  - Fixed income provides an important liquidity function to the portfolio. It facilitates benefit payment funding and portfolio rebalancing during equity market drawdowns.
  - ARMB cash is managed within the Fixed Income asset class. Contributions and distributions are managed on a daily basis.
  - Internal Fixed Income also provides important liquidity tools to manage the uncertain timing of private market capital calls and distributions.

Historical Drawdown
S&P 500 Vs. Bloomberg Barclays Aggregate Index

- A maximum drawdown is a measure of risk. It is the maximum loss from a peak to a trough in a portfolio before a new peak is achieved. It is an indicator of downside risk when considering much shorter investment time periods.
- 2008/2009 S&P 500 index drawdown was -52%.
- 2008/2009 Bloomberg Barclays Aggregate index drawdown was -1%.



Past Performance of Equity vs Fixed Income In Recession

		S&P 500	Bloomberg Barclays Aggregate
Jan-80	Apr-80	-5.60%	4.80%
Jul-81	Mar-82	-11.20%	12.40%
Jul-90	Nov-90	-8.60%	4.30%
Mar-01	Jul-01	-1.94%	3.14%
Dec-07	Sep-08	-19.90%	0.91%
Feb-20	?	-20.15%*	1.17%*

** Performance from Feb 3, 2020 through March 31, 2020.*

- Fixed income has generated positive returns during the early stages of a recession when equity decline is greatest.
- Unlike past recessions where rates were higher, current rates are much lower. With lower rates and an implied floor of ~0%, the appreciation potential of the asset class is limited.
- However, we still expect fixed income will provide diversification and capital preservation benefits to the portfolio during significant equity downturns and also provide a source of return through yield carry.

Fixed Income Flows

- Average yearly amount of net cash flows in ARMB fixed income:
  - ARMB Intermediate Treasury Pool: $882mm contributions, $1.13bn redemptions
  - ARMB Barclays Aggregate Fund: $2.62bn contributions, $745mm redemptions
- Average yearly count of net cashflows in ARMB fixed income:
  - ARMB Intermediate Treasury Pool: 459 contributions, 421 redemptions
  - ARMB Barclays Aggregate Fund: 254 contributions, 142 redemptions

Internal Fixed Income Process

Fixed Income Investment Process

- Identify a broad range of potential movements in the yield curve from one to three months into the future.
- Position portfolios to attempt to outperform modestly over a broad range of scenarios.
- Manage trading costs and give liquidity sparingly.
- Seek yield in non-Treasury holdings:
  - Position portfolio in higher conviction securities.
  - Diversify positions.

Risks to Investment Approach

- Future yield curve changes and the implied volatility of interest rates may be different than what we forecast.
- Changes in risk tolerance in the market are not explicitly incorporated, so this could detract from performance.
- Idiosyncratic, bond-specific, credit and structural risk are also present.

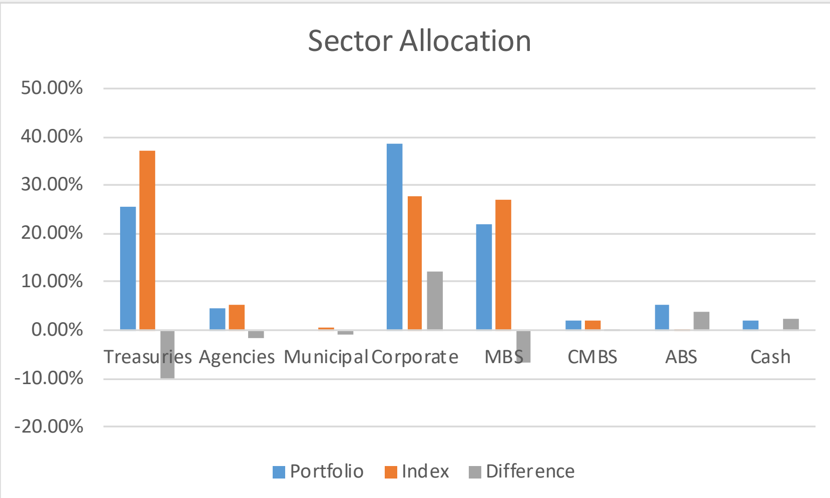
Dependence on Technology and Generalizations

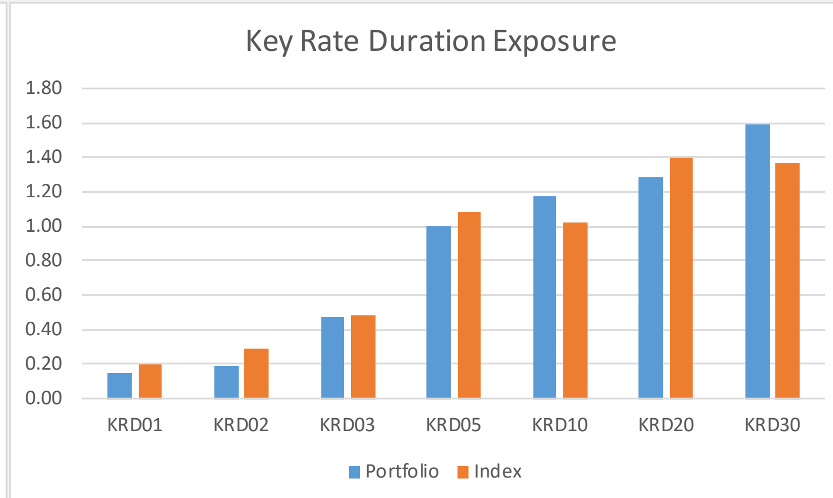
- The number of combinations of n objects taken r at a time is:

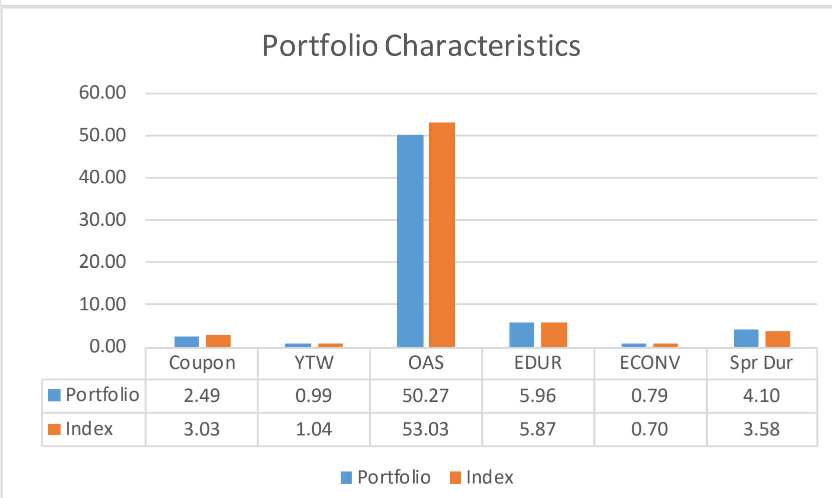
  $$C(n,r) = (n!)/(r!(n-r)!)$$

- For a portfolio of twenty stocks taken from the S&P500, and ignoring relative weights, there would be (500!)/(20!(500-20)!) possible portfolios, which is a large number.
- For fixed income investors, the possible portfolio of twenty (or even 200) distinct bonds is a very, very large number.
- Not something which lends itself to optimizing with a pencil and a sheet of scratch paper.
- Solutions include:
  - Technology, and
  - Generalizations of characteristic exposure

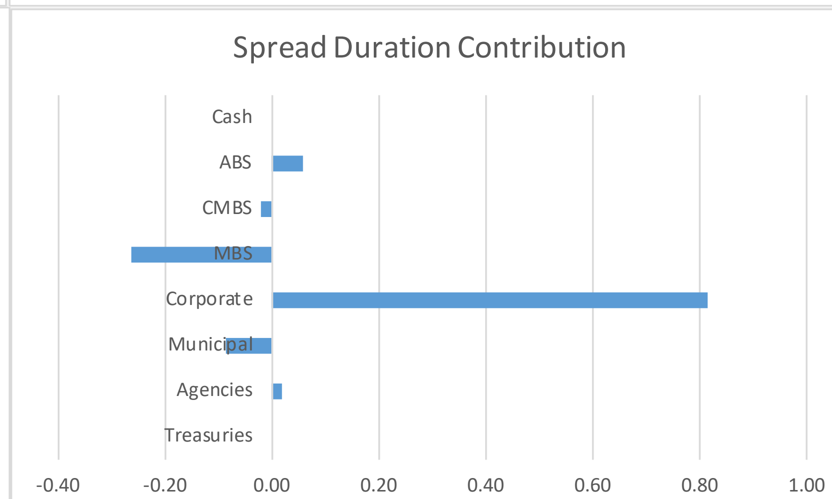
ARMB Fixed Income Dashboard



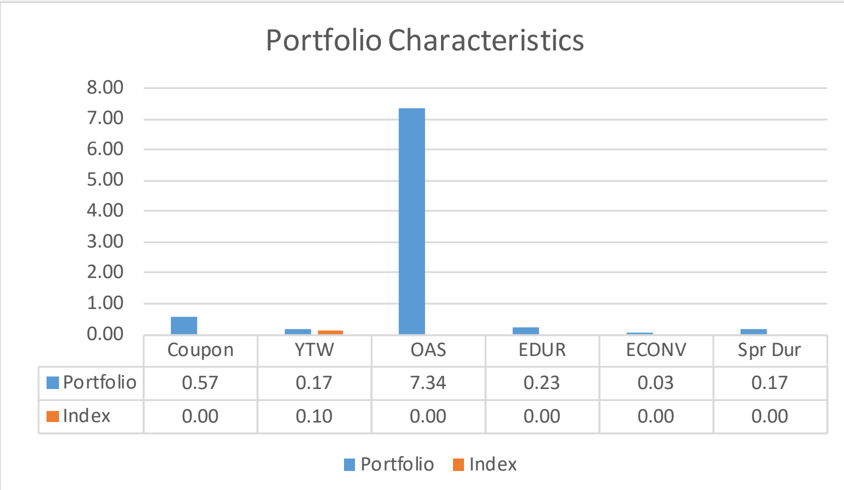




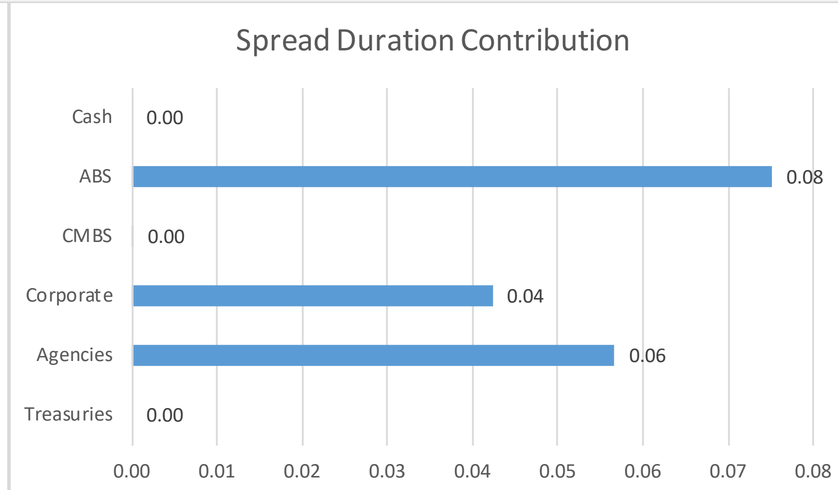
	Coupon	YTW	OAS	EDUR	ECONV	Spr Dur
Portfolio	2.49	0.99	50.27	5.96	0.79	4.10
Index	3.03	1.04	53.03	5.87	0.70	3.58

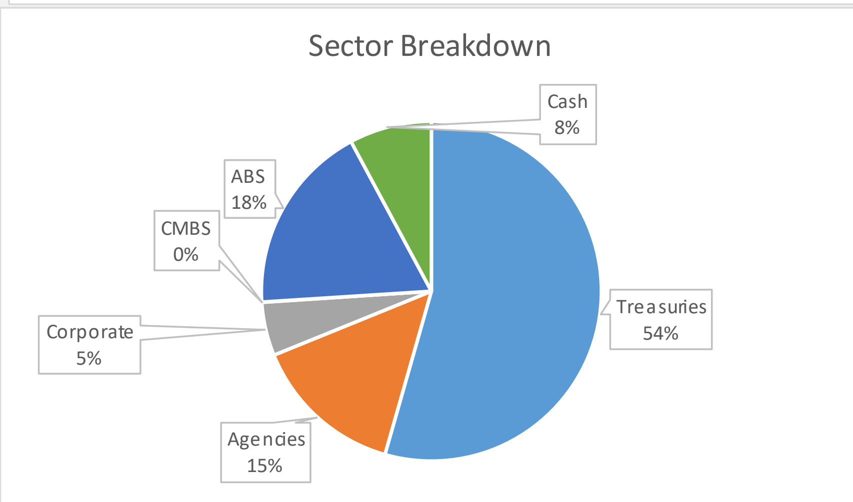


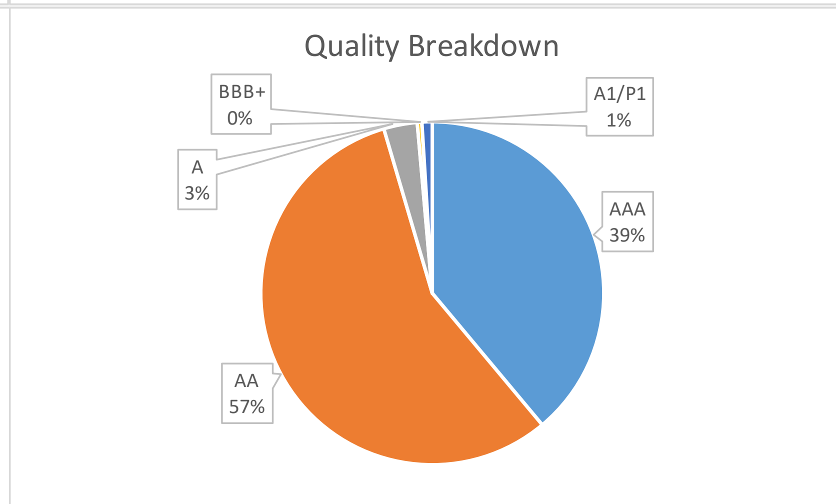
Short-term Fixed Income Dashboard



	Coupon	YTW	OAS	EDUR	ECONV	Spr Dur
Portfolio	0.57	0.17	7.34	0.23	0.03	0.17
Index	0.00	0.10	0.00	0.00	0.00	0.00







Performance

As of Sep 30, 2020	Last Quarter	1 Year	3 Year	5 Year	10 Year
Short-term Fixed Income (AY70)	0.08%	1.25%	1.85%	1.45%	0.89%
3M T-Bill	0.04%	1.10%	1.69%	1.20%	0.64%
	0.04%	*0.15%*	*0.16%*	*0.25%*	*0.25%*

As of Sep 30, 2020	Last Quarter	1 Year
ARMB Barclays Agg Bond Fund (AY77)	0.73%	8.40%
Bloomberg Barclays Aggregate Index	0.62%	6.98%
	0.11%	*1.42%*

As of Sep 30, 2019	Last Quarter	1 Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 9-1/4 Years
US Treasury Pool (AY1A)	1.40%	7.90%	3.27%	1.99%	2.37%	2.21%	2.32%
Bloomberg Barclays Intermediate Treasury Index	1.18%	7.58%	3.08%	1.80%	2.19%	2.01%	2.14%
	0.22%	*0.32%*	*0.19%*	*0.19%*	*0.18%*	*0.20%*	*0.18%*

Summary

- Fixed Income Market Outlook
  - US Treasury yields are likely to remain low for the foreseeable future
  - Investment grade spreads are likely to remain tight

- Role of Fixed Income
  - Diversifier
  - Generate stable yield
  - Provides liquidity

- Internal Fixed Income Process
  - Portfolio Positioning
  - Portfolio Performance

ALASKA RETIREMENT MANAGEMENT BOARD

Risk Management
and
Liquidity

December 2020

Shane Carson, CAIA, CFA
State Investment Officer

Key Board Decisions

Determine Investment Objective

- Fund's Purpose
- Governance – who makes which decisions?

Determine Asset Allocation

- Strategic
- Tactical

Oversee Implementation

- Manager Structure – number and types of manager allocations.
- Manager Selection

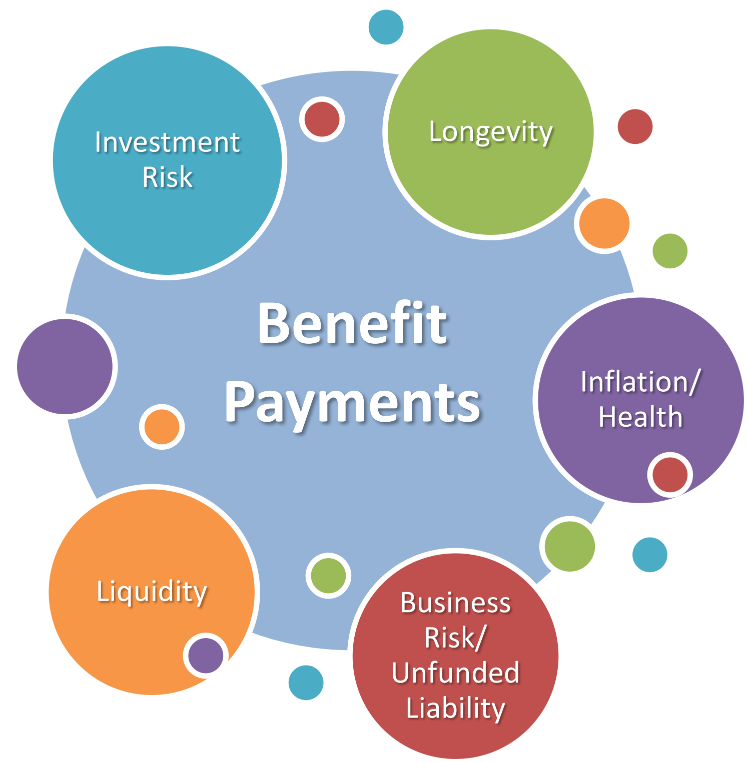
Monitor Results

- Are the fund, asset classes and mandates performing as expected?
- Are they achieving objectives?

What Does Risk Mean to a Retirement System?

What does risk mean to the ARMB?

- At its most comprehensive, risk is anything that could impact the objectives of the retirement systems.
- The defined benefit systems' primary objective is to pay all benefits when they are due.
- Risk encompasses both assets and liabilities.
- Defined benefit systems are designed to be able to take risks – pooling market, longevity, and other risks across time and a broad pool of participants.
- Setting and monitoring investment risks is one of the primary roles of the ARMB.



Risk Monitoring Tool: truView

- The ARMB is using truView for portfolio risk analytics. truView is State Street Global Exchange's risk measurement platform.
- truView analytics are run every six months and the current results are as of June 30, 2020.
- We use truView to help answer the following questions:
  - Is the portfolio risk positioned according to the ARMB's asset allocation?
  - What is the probability and magnitude of potential losses?
  - Is the ARMB taking more or less risk than the strategic benchmark by asset class?
  - Are specific investment mandates or managers adding to or reducing risk?
  - Does the ARMB have unexpected risk exposures or concentration?
  - How would the ARMB's current portfolio perform in historic market events or scenarios?

Asset Allocations

- Portfolio deviations from policy target are due to market performance during the quarter and rebalancing trades that were implemented on June 30 to effect the fiscal year 2021 asset allocation which included an increase in Broad Domestic Equity from 26% to 28%.
- Total portfolio volatility is dominated by public equities at 62%.
- Public and private equities contribute 77% of total volatility.
- Prior analysis showed a volatility of 7.8%. Events of 2020 have significantly increased portfolio volatility to 12.6% but still lower than forward expectations of 13.6% determined by the fiscal year 2021 asset allocation.

Asset Allocation Relative to Policy Benchmark

	Market Value (Millions)	Allocation (%)	Policy Benchmark (%)	Relative (%)
Broad Domestic Equity	7,530	28.4%	26.0%	2.4%
Global Equity Ex-US	5,041	19.0%	18.0%	1.0%
Real Assets	3,612	13.6%	13.0%	0.6%
Broad Fixed Income	5,903	22.2%	24.0%	-1.8%
Private Equity	3,000	11.3%	11.0%	0.3%
Opportunistic	1,472	5.5%	8.0%	-2.5%
TOTAL	**26,557**	**100.0%**	**100.0%**	**0.0%**

Volatility Decomposition

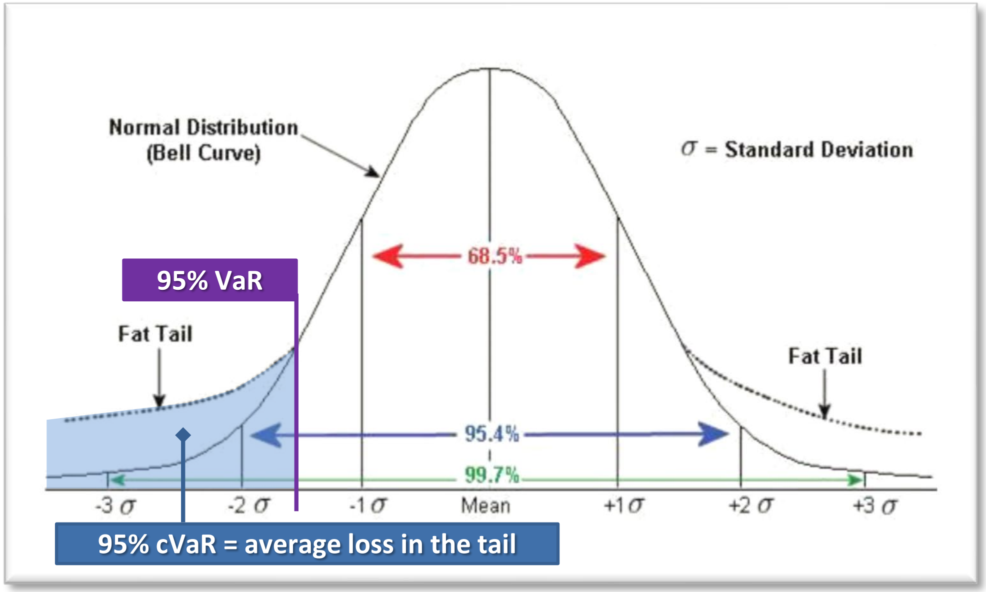
	Market Value (Millions)	Allocation (%)	Volatility[1] (% per annum)	Volatility Contribution (% of Total Vol)
Broad Domestic Equity	7,530	28.4%	16.8%	37.2%
Global Equity Ex-US	5,041	19.0%	16.9%	24.8%
Real Assets	3,612	13.6%	14.4%	13.0%
Broad Fixed Income	5,903	22.2%	3.3%	4.6%
Private Equity	3,000	11.3%	16.8%	14.9%
Opportunistic	1,472	5.5%	12.8%	5.6%
TOTAL	**26,557**	**100.0%**	**12.6%**	**100.0%**

1: Value-at-Risk is calculated using historic Value-at-Risk at 95th percentile, 1 month horizon, annualized, and expressed as a percentage of the Total Plan's assets.

What is Value-at-Risk?

- Value-at-risk (VaR)
  - A commonly used measure of potential loss.
  - VaR is the maximum expected loss with a specific frequency over a given time horizon.
  - VaR can be estimated parametrically using the mean and standard deviation, but this ignores fat tails (kurtosis, skewness).
  - VaR also can be estimated using historic market information, which includes past fat tails – this is the approach truView takes.
- Expected shortfall (conditional VaR or cVaR) is the average loss contained in the left tail.

- Why are VaR and cVaR important?
  - They quantify the risk of loss for the portfolio.
  - VaR differences between historical and parametric provide insight into fat tails.

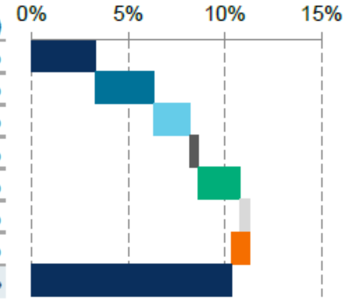


Asset Class Risk & Diversification

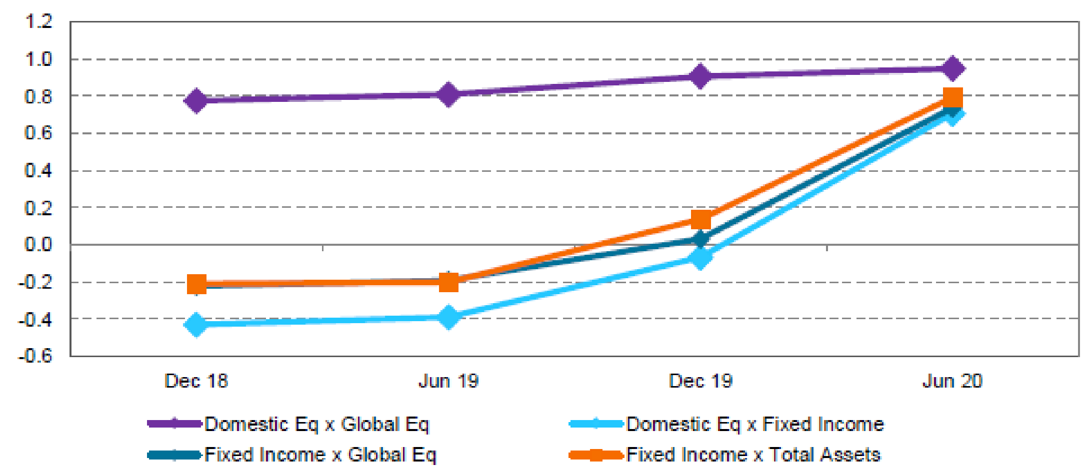
- The value-at-risk is 10.3%.
- Broad Domestic Equity and Global Equity Ex-US contributed 56% of the VaR for 6/30/2020, up from approximately 50% at 12/31.
- Overall, the asset class diversification benefit decreased in the 6/30/2020 report due to a significant increase in cross asset class correlations during the first half of 2020.

Asset Class Risk & Diversification

	Allocation (%)	Value-at-Risk[1] Contribution (% of Total VaR)	Value-at-Risk[1] (% of Total MV)
Broad Domestic Equity	28.4%	29.8%	3.3%
Global Equity Ex-US	19.0%	26.5%	3.0%
Real Assets	13.6%	13.6%	1.8%
Broad Fixed Income	22.2%	5.1%	0.5%
Private Equity	11.3%	20.0%	2.2%
Opportunistic	5.5%	5.1%	0.5%
Diversification Benefit	-	-	-0.9%
TOTAL	**100.0%**	**100.0%**	**10.3%**



Correlation of Major Asset Classes Trend



Equity Beta

- Equity Betas are within expectations for 6/30/2020.
- Small capitalization domestic stocks and emerging market stocks had higher betas to broader markets.
- ARMB's domestic and Global ex-US portfolios should closely parallel the respective benchmarks.

Sub Asset Class Beta Analysis

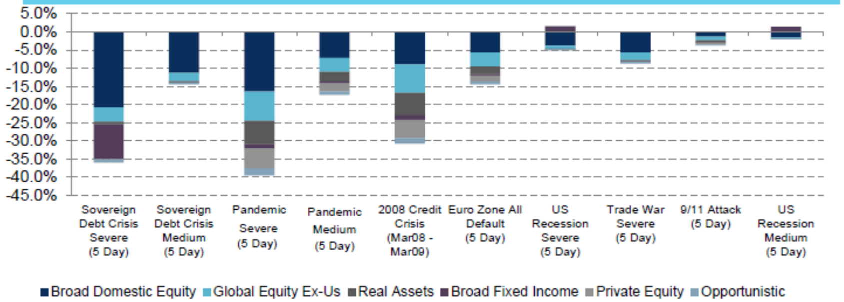
Asset Class / [Benchmark]	Market Value (Millions)	Allocation (%)	Beta[1] 1Y to the Benchmark	Beta[1] 5Y to the Benchmark
Broad Domestic Equity / [Russell 3000]	**7,530**	**59.9%**	**0.96**	**0.97**
Large Cap Pool (AYQK)	6,921	55.1%	0.93	0.95
Small Cap Pool (AYQC)	609	4.8%	1.29	1.24
Global Equity Ex-Us / [MSCI ACWI Ex US IMI]	**5,041**	**40.1%**	**0.96**	**0.96**
Emerging Markets Pool (AYSC)	872	6.9%	0.91	1.02
IE Large Cap Pool (AYRC)	4,169	33.2%	0.96	0.95
TOTAL Equity / [MSCI ACWI]	**12,571**	**100.0%**	**0.98**	**0.99**

1. Beta is the regression coefficient generated by a linear regression of the percent return time series of position on an explanatory time series. This explanatory time series is often composed of the returns from a broader market index, the Benchmarks of each of the Equity Asset Classes.

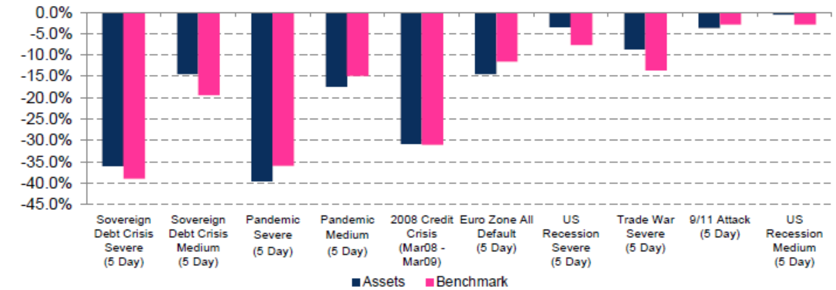
Stress Tests

- Stress tests reveal no significant underperformance expectations versus the target benchmark.

Asset Class Breakdown



Portfolio vs. Benchmark



Stress Tests Returns Contribution to Total (Assets)

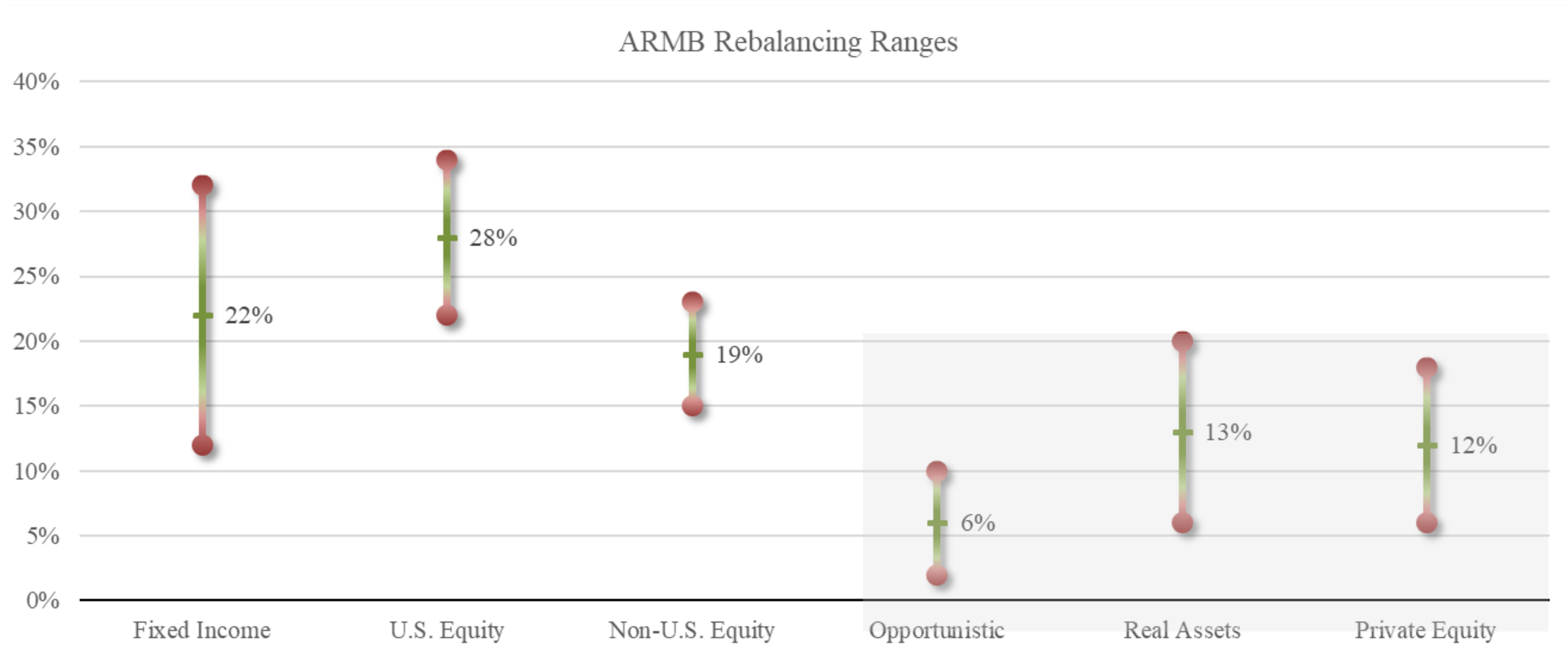
	Market Value (Millions)	Allocation (%)	Sovereign Debt Crisis Severe (5 Day)	Sovereign Debt Crisis Medium (5 Day)	Pandemic Severe (5 Day)	Pandemic Medium (5 Day)	2008 Credit Crisis (Mar08 - Mar09)	Euro Zone All Default (5 Day)	US Recession Severe (5 Day)	Trade War Severe (5 Day)	9/11 Attack (5 Day)	US Recession Medium (5 Day)
Broad Domestic Equity	7,530	28.4%	-20.8%	-11.3%	-16.5%	-7.2%	-8.9%	-5.7%	-3.8%	-5.7%	-1.4%	-1.6%
Global Equity Ex-Us	5,041	19.0%	-3.9%	-2.3%	-8.0%	-3.9%	-7.9%	-3.9%	-0.9%	-2.1%	-0.9%	-0.2%
Real Assets	3,612	13.6%	-0.7%	-0.5%	-6.4%	-2.6%	-6.2%	-2.0%	-0.2%	-0.3%	-0.5%	-0.1%
Broad Fixed Income	5,903	22.2%	-9.7%	0.0%	-1.2%	-0.5%	-1.3%	-0.4%	1.5%	-0.2%	-0.3%	1.4%
Private Equity	3,000	11.3%	0.0%	0.0%	-5.4%	-2.2%	-4.9%	-1.7%	0.0%	0.0%	-0.4%	0.0%
Opportunistic	1,472	5.5%	-0.9%	-0.5%	-2.1%	-1.0%	-1.6%	-0.9%	-0.1%	-0.4%	-0.2%	0.0%
TOTAL	**26,557**	**100.0%**	**-36.0%**	**-14.5%**	**-39.6%**	**-17.4%**	**-30.8%**	**-14.5%**	**-3.5%**	**-8.7%**	**-3.7%**	**-0.5%**

Portfolio Liquidity

- Liquidity can come from several sources:
  - Contributions to plans
  - Cash income from stock dividends, bond coupon payments, real asset leases and fund distributions
  - Selling of assets
- Liquidity is important and needed to:
  - Make benefit payments
  - Portfolio rebalancing
  - Fund prior investment commitments
- Liquidity is impacted by market environment
  - During normal market conditions liquidity is the combination of selling assets and timely income.
  - During market stress, selling assets for liquidity may be at substantial price discounts.

ARMB Rebalancing

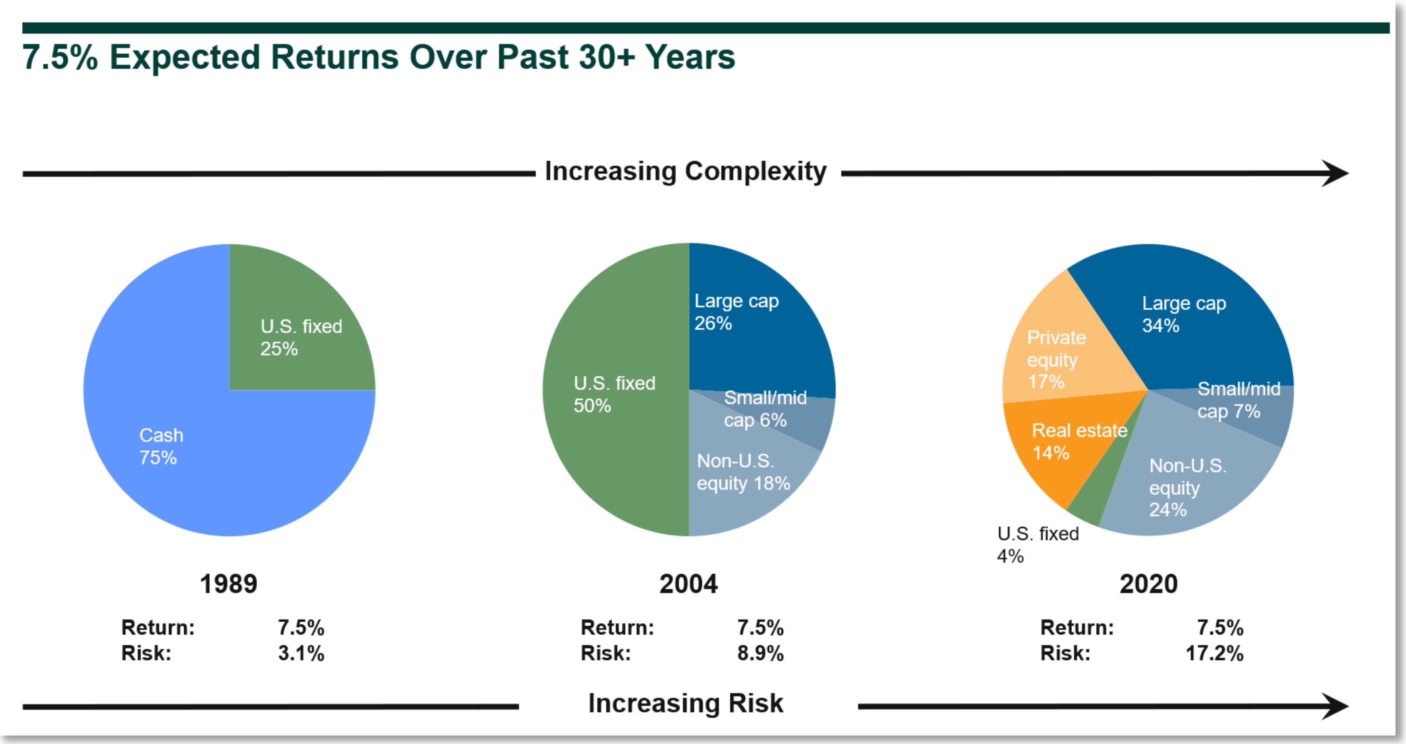
- The asset allocation includes ranges or bands allowing for deviation from targets
- The Fixed Income band is 10% increasing the portfolio's ability to endure a significant equity drawdown
- During a significant equity drawdown, fixed income asset sales will likely be the source of liquidity



FY 2021 PERS asset allocation targets.

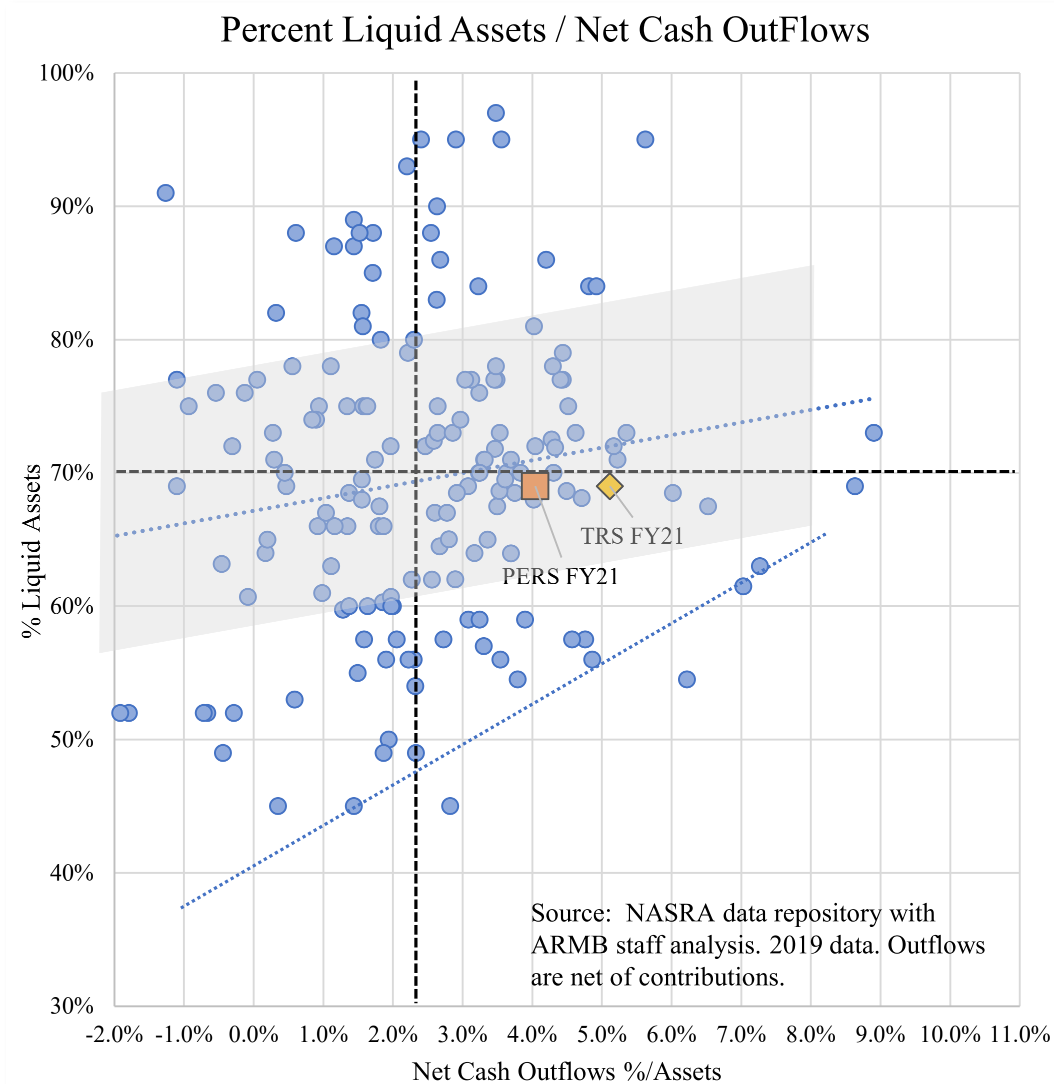
Illiquid Assets

- As asset class return expectations have decreased, causing institutional investors to increase allocations to illiquid assets seeking better diversification, capturing liquidity premium, and greater manager specific alpha.



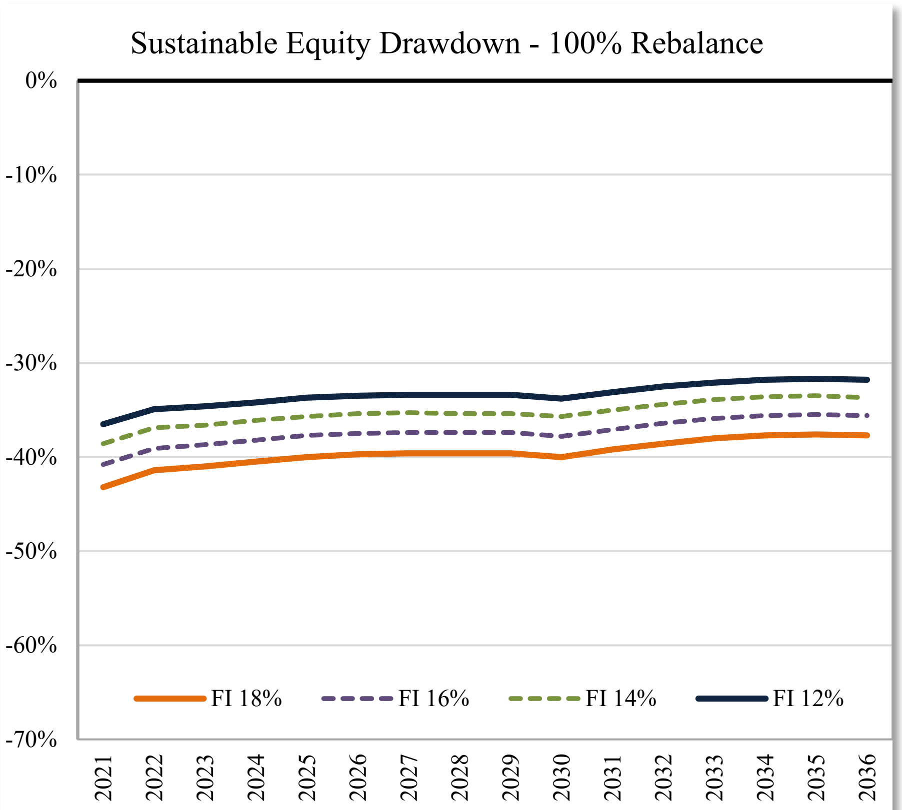
Peer Liquidity

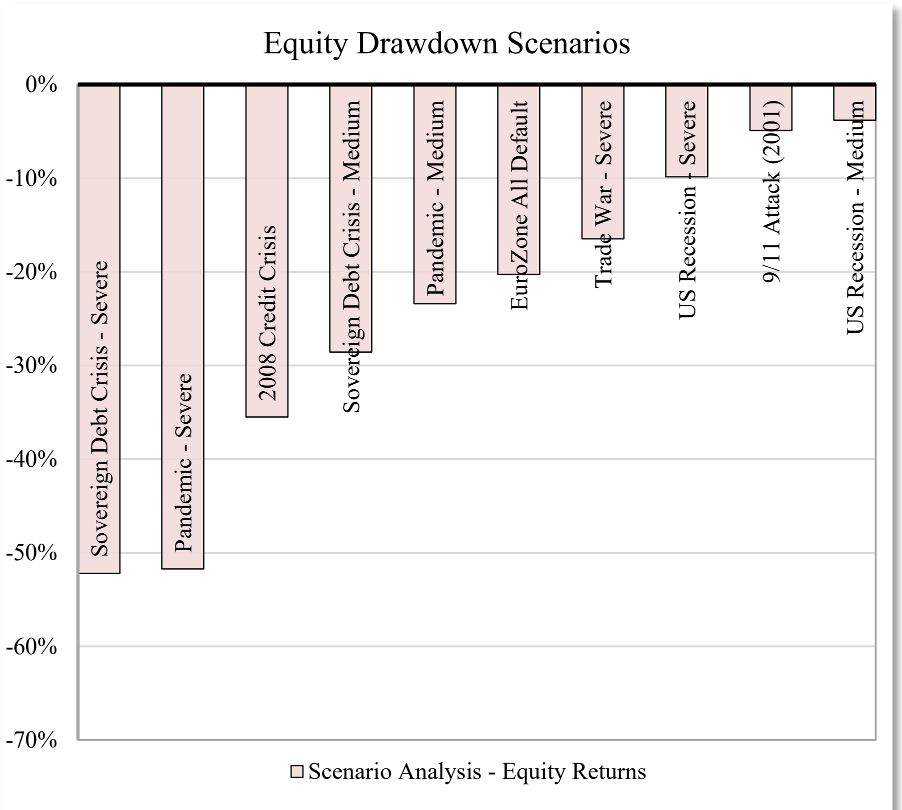
- The ARMB plans are close to median peers' percent of liquid assets.
- The ARMB plans are closed and mature so Net Outflows are higher than median.
- Peer's percent of liquid assets tends to increase as Net Outflows increase and liquidity management needs increase.



Liquidity and Market Stress

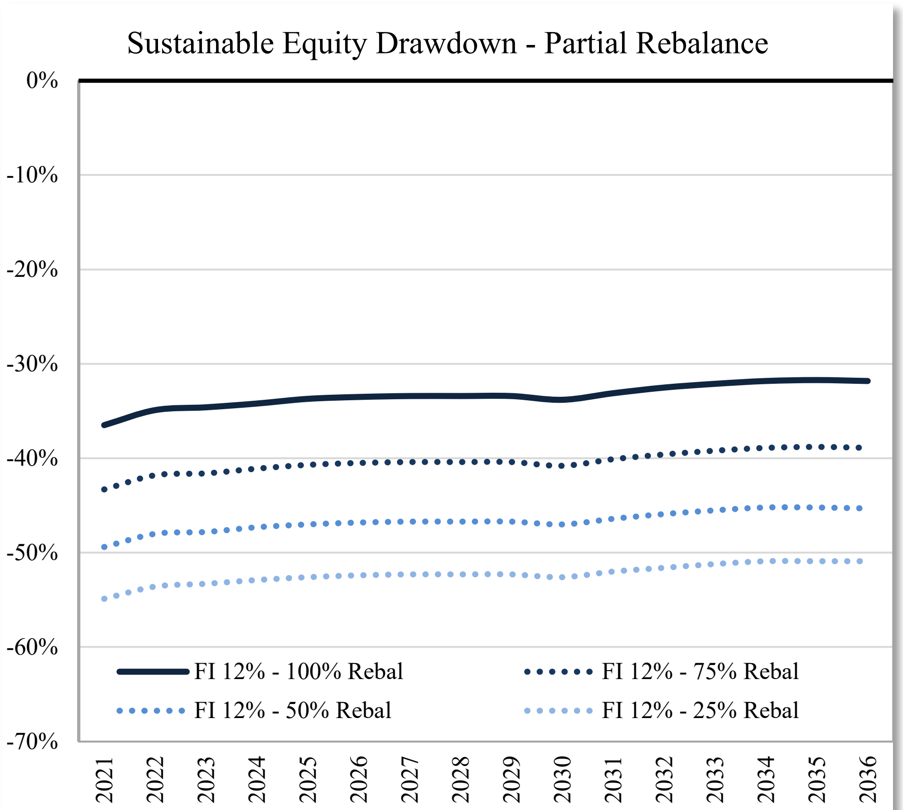
- The allocation to liquid fixed income directly impacts the portfolio's ability to rebalance during an equity drawdown.
- Reducing the allocation to liquid fixed income increases growth expectations but also reduces the ability to rebalance during periods of market stress.

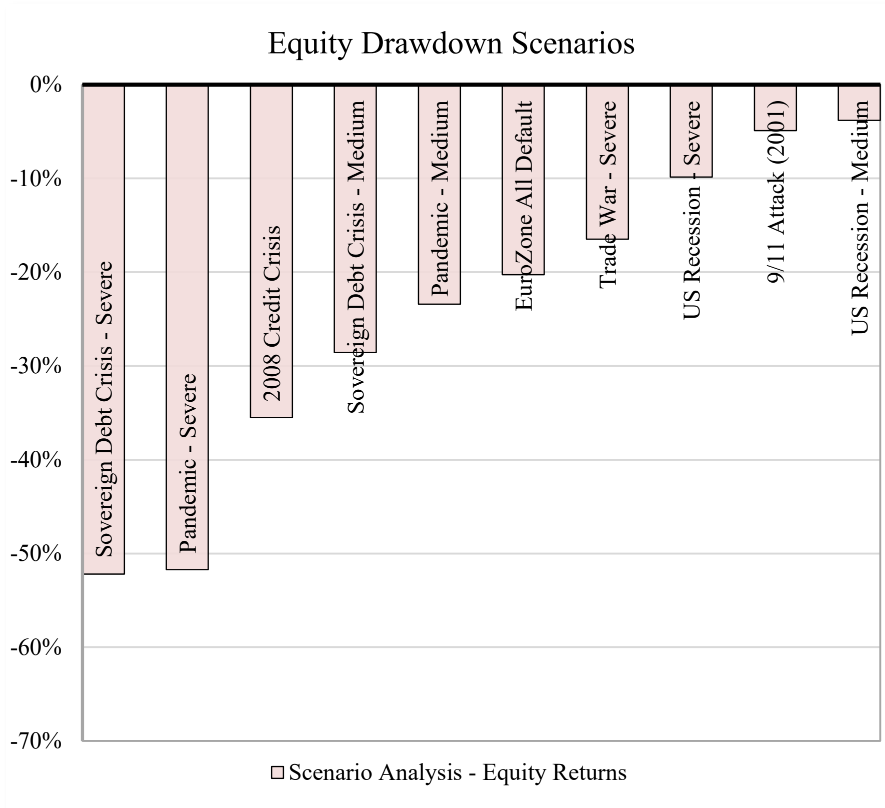




Liquidity and Market Stress

- Partial rebalancing increases the portfolio's ability to withstand an equity drawdown.
- Partial rebalancing may reduce transaction costs and liquidity strain but increases the tracking error from target asset allocation performance.





Summary

- The first half of 2020 saw significant market volatility increasing overall portfolio volatility and value at risk.
- Overall, risk metrics were within expectations.
- Institutional portfolios are increasing in portfolio complexity and liquidity risk to compensate for downward trending return expectations.
- ARMB is exposed to liquidity risk and should expect to be compensated.
- The ARMB liquidity profile is currently sufficient to sustain all but the most severe crisis scenarios.
- The portfolio may be able to satisfy liquidity requirements while increasing the allocation to illiquid asset classes.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Amendment to IAC Contracts

ACTION: X

DATE: December 4, 2020

INFORMATION:

BACKGROUND:

Under AS 37.10.270(e), the Investment Advisory Council (IAC) may contract with other state agencies to provide investment advice, if approved by the Alaska Retirement Management Board (ARMB).

In addition to the retirement funds, the Treasury manages other state funds under the fiduciary responsibility of the Commissioner of Revenue. The Commissioner has determined that receiving investment advice from the IAC regarding state investments would be beneficial. As such, the Commissioner is requesting approval from the ARMB for the IAC to provide investment advice for state assets under her fiduciary responsibility.

STATUS:

The current IAC contracts can be easily amended to add advisory services relating to state assets and the current IAC members are willing to expand their services accordingly upon the approval of the ARMB. The IAC members will be compensated separately for services provided directly to the State.

The IAC members are scheduled to meet with the Commissioner Mahoney and CIO Hanna mid-December to discuss the expansion of services.

RECOMMENDATION:

The Alaska Retirement Management Board approve the expansion of the IAC's services to include the state assets under the fiduciary responsibility of the Commissioner of Revenue.

ALASKA RETIREMENT MANAGEMENT BOARD (ARMB)

SUBJECT:	Custody Contract	ACTION:	X
		INFORMATION:	
DATE:	December 4, 2020		

BACKGROUND

The ARMB's exemption from state procurement is outlined under AS 36.30.990(1)(B)(vii).

ARMB Regulation 15 AAC 112.350 (a) states that "As provided in AS 37.10.071, the board may delegate investment, custodial, or depository authority. Contracts for these professional services will be supported under an official delegation of authority issued by the board." (b) states that the ARMB regulations "do not apply to the delegation of authority AS 37.10.071 and (a) of this section" which includes custodial duties.

Resolution 2016-02 delegates procurement related authority to staff to procure professional services deemed necessary for day-to-day operations of the Board.

The current professional services custody contract with State Street Bank expires 6/30/2021.

STATUS

The Treasury Division Director is currently discussing extension of the custody contract with State Street Bank.

RECOMMENDATION

The Alaska Retirement Management Board approves use of its delegation to Director Leary to negotiate the extension of the Custody contract for a period not to exceed 5 years.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: ARMB Actuary Audit Procurement | ACTION: X

DATE: December 4, 2020 | INFORMATION:

BACKGROUND:

AS 37.10.220(a)(10) provides that the Alaska Retirement Management Board (the Board) shall contract for an independent audit of the state's actuary not less than once every four years. The Board directed staff at its September meeting to prepare a request for proposal (RFP) for an independent audit on the following:

- FY2019 actuarial valuations for the PERS DB, TRS DB, and PERS/ TRS DCR systems,
- FY2018 actuarial valuations for the NGNMRS and JRS (most recent valuation of each system), and
- 2019 Experience Analysis completed for the years July 1, 2013 – June 30, 2017.

STATUS:

Upon research and discussion with legal counsel, the above statute does not preclude the review actuary, currently Gabriel Roeder Smith (GRS), from performing the independent audit of the state's actuary. Further, the Board may conduct a sole source procurement per 15 AAC 112.160, for the independent audit of the state's actuary if accompanied by a written explanation as to why a procurement from a source is in the best interest of the beneficiaries of the pension funds.

GRS has confirmed that they would be able to perform the audit in addition to the actuarial review work they currently perform and that they would be able to do the work for a lower cost than others since they have up-to-date models, current data, and years of experience with the plans.

RECOMMENDATION:

The ARMB Actuarial Committee recommends the Board direct staff to pursue a sole source procurement contract and concurrently manage an expression of interest process for an independent audit of the state's actuary, focused solely on recent valuation reports, with GRS since it is in the best interest of the beneficiaries of the pension funds.

PUBLIC COMMENTS:

Public comment was given by the following people:

1. Mr. Doug Woodby, PERS Recipient (Verbal)
2. Mr. Bob Schroeder, PERS Recipient/350Juneau Member (Verbal)
3. Mr. Jim Simard, PERS Recipient (Verbal)
4. Mr. Michael Tobin, (Verbal)
5. Mr. Nils Andreassen, AML Executive Director (Verbal)